PACKAGE engineering

Determining a product's packaging needs

A close look at the process of evaluating the packaging requirements of a product (with supporting data), with emphasis on the problems of choosing and applying flexible packaging materials. (See page 19)

Practical inspection of metal cans

Reviewing step by step the techniques of actually checking metal cans after the samples have been taken as well as the checking of these cans after they are filled and seamed in the user plant. (See page 26)

Plain talk about the "G" factor

A thorough, clear, and simple discussion of the "G" factor and its application to packaging — with pertinent examples and without any haze of mathematical mystery. (See page 41)

Complete table of contents on Page 2

JULY 1957

VOLUME 2 • NUMBER 7

"Now is the time... to think about Christmas

Photo courtesy
General Cigar Co., Inc.

Multiple Wrapping by SCANDIA

SCANDIA

Manufacturers of Better Packaging Machinery

500 BELLEVILLE TURNPIKE • NORTH ARLINGTON, N. J.

BUNDLING • BANDING • MULTIPLE WRAPPING • STAMPING • HIGH SPEED WRAPPING

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Aluminum Foil Packaging– Resistance to Insect Infestation

Report No. 10 of a Series by Reynolds Metals Company

Insect infestation of packaged foods and other products is important from the standpoint of health and sanitation as well as economics. And products, even though free of insects when packaged, may become infested by insects penetrating the package material itself.

Food manufacturers and processors are vitally concerned with the insect resistance of packaging materials. Consumers, too, have a stake in this—and so do wholesalers and market operators who can boost profits by purchasing in larger quantities. The risk is big, however, because of the difficulty and expense of insect control. Regardless of storage care, packaged foods pass through so many channels that contact with a wide variety of insects is inevitable.

The ability of insects to penetrate packages varies. It depends on the species of insect and its stage in life, the presence of folds, creases or scratches on the outside surface of the package, and particularly upon the type and thickness of the packaging material.

Among all materials, aluminum foil is outstanding in its ability to resist penetration by insects. This is in addition to its well known superiority in maintaining freshness and flavor by excluding moisture, air, odors and light.

Aluminum foil has several properties that make it an excellent insect barrier. It is hard, making it difficult for most species to bore through. It is odorless, tasteless and has no food value to attract insects. It is opaque and insects appear to prefer transparent materials. Since hunger or the desire for seclusion is the driving force that causes insects to bore through packaging materials, they are selective in their attacks. Most plastic and organic packaging materials absorb or allow the escape of food odors that insects can detect. In many instances, these materials themselves have characteristic odors or tastes that attract insects. Aluminum foil is non-absorptive and practically impermeable, making it an ideal component for insect-resistant packages.

Studies with various insects, particularly the cadelle and the lesser grain borer (both extremely good borers), have shown that they will penetrate 80% to 85% of packages made from widely used plastic films within two or three weeks' time. Proper use of 0.001" aluminum foil cuts this penetration to zero over a one month test period.

Greatest attention to this insect problem is being given to consumer packages—generally sealed overwraps, carton liners or pouches. But bulk storage of products for future use or processing presents an even greater problem. The solution is provided by the large variety of aluminum foil materials and packages available for bulk storage. These include multiwall bags with aluminum foil liners, case liners of aluminum foil, foil-lined fiber drums, and aluminum foil for lining storage bins. Use of aluminum foil for lining storage bins also permits effective fumigation to prevent reinfestation without contaminating the products stored.

The accompanying table gives the results of a controlled one-year test of insect infestation in a bulk storage situation.

Reynolds research facilities and experience are available to help solve your packaging problems. Call your nearest Reynolds representative. Or write **Reynolds Metals Company,** General Sales Office, Louisville 1, Ky.

EFFECTIVENESS OF ALUMINUM FOIL IN COMBATING INSECT INFESTATION

STORED PRODUCT
Tobacco, 1000-lb. lots

INFESTING INSECTS
Tobacco Beetle and Moth

DURATION OF TEST
One Year

CONTAINERS TESTED
Unlined Hogsheads and Hogsheads lined with laminated aluminum foil material (.0015" heat-sealing plastic film .001" aluminum foil 80-lb. paper)

RESULTS OF TEST

UNLINED HOGSHEADS
All were infested to a depth of 10 to 11 inches. Resulting tobacco loss was as high as 6%.

LINED HOGSHEADS
Infestation was confined to two small surface areas where lining material had been punctured. Penetration zero. Loss zero.

See "Circus Boy", Sundays, NBC-TV. Watch for Reynolds on "Disneyland", ABC-TV Network.

©Reynolds Metals Company, Louisville 1, Kentucky

For your calendar

July 15-19. American Management Association packaging clinic on the management of the packaging operations, Colgate University, Hamilton, New York. Contact: John A. Warren, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

August 12-16. American Management Association packaging clinic on cost reduction in an industrial packaging program, Colgate University, Hamilton, New York. Contact: John A. Warren, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

October 1-3. Third Joint Military-Industry Packaging and Materials Handling symposium, Fort Lee, Virginia. Contact: Procurement Division, Deputy Chief of Staff for Logistics, Department of the Army, Washington 25, D. C.

October 28-30. Packaging Institute, 19th annual forum, Hotel Statler, New York. Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, New York. *Telephone: Murray Hill 7-8875.*

October 28-31. Society of Industrial Packaging and Materials Handling Engineers, 12th national industrial packaging and handling exposition and SIPMHE short course, Atlantic City Auditorium, Atlantic City, New Jersey. Contact: C. J. Carney Jr., managing director, Society of Industrial Packaging and Materials Handling Engineers, 111 West Jackson Blvd., Chicago 4, Illinois. *Telephone: Harrison 7-6123.*

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PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

Articles

19 **Evaluating the packaging requirements of a product,** by Carl L. Brickman, manager, product testing laboratory, Standard Packaging Corporation
A close examination of the product evaluation process, with an explanation of reasons underlying the points of special attention, as well as supporting data in regard to flexible packaging material selection and application.

26 **Practical inspection of empty and filled metal cans**
M & R Dietetic Laboratories Inc. has a battery of practical tests for the examination of in-coming empty metal cans, as well as filled cans, closed and seamed on the plant's equipment.

31 **Blind people prove useful in packaging assembly work,** by Thomas M. Glynn, production manager, John H. Breck, Inc.
Use of the local workshop for the blind permits effective sub-contracting of packaging assembly work as frequently encountered in short runs, new items, and other sudden or unpredictable demands for packaging.

34 **Simplifying and controlling package label usage,** by Robert F. House, packaging engineer, Appleton Electric Company
A unique system of centralized inventory control goes hand in hand with the development of machinery and operational techniques to permit peak efficiency of label and package material usage — including minimized label inventories for a diverse product line.

41 **The elusive "G" factor,** by Halden L. Lewis, packaging consultant, Elmira, New York
Cutting through the confusion and misunderstanding about the "G" factor, this article provides an unusually clear explanation of the application of the "G" factor in the mechanics and workings of packaging — and the forces and vulnerabilities involved.

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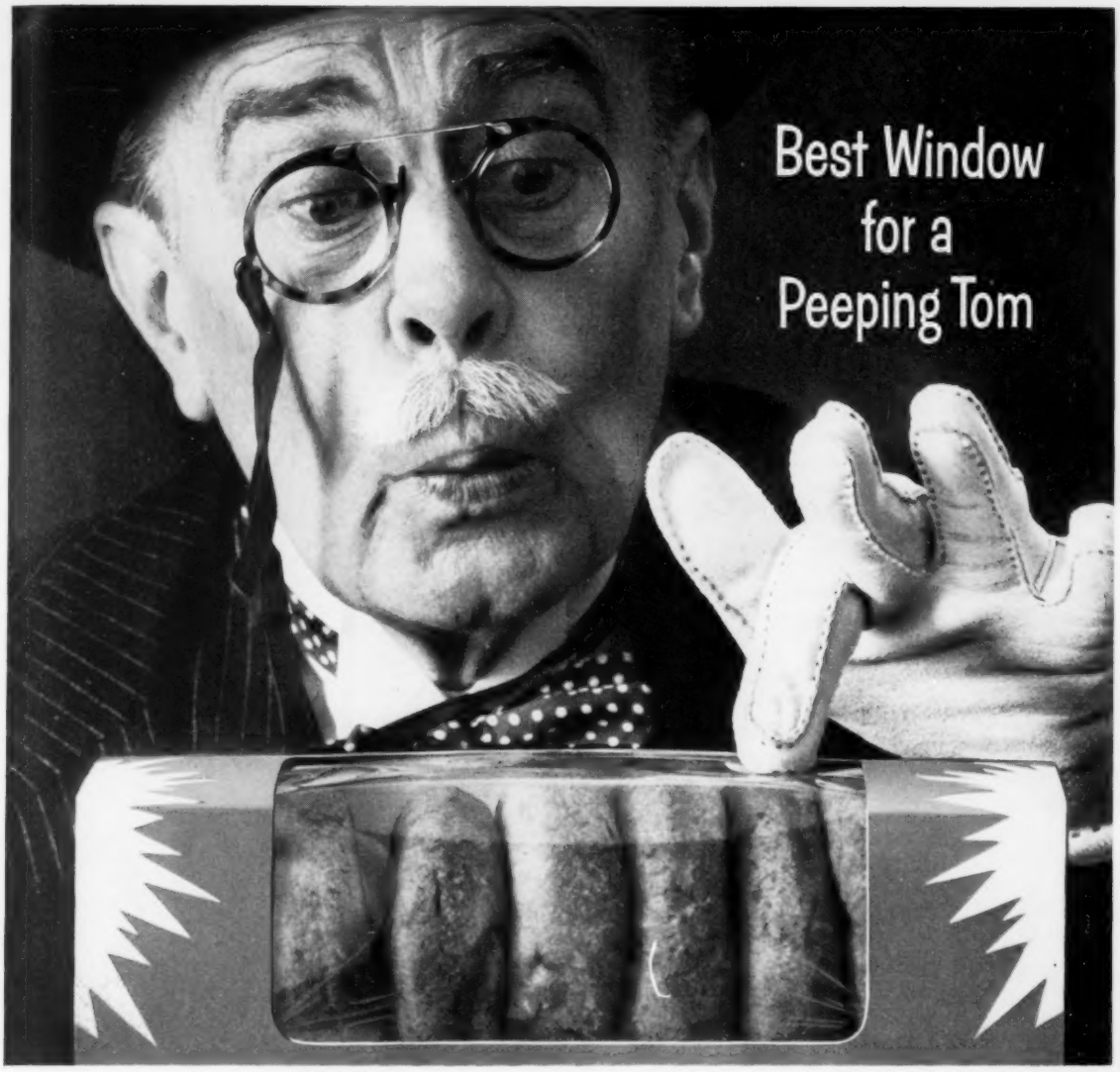
58 **What we think** (our editorial page)

Reader service card inside back cover

Our December 1957 issue will carry a cumulative editorial index for the year listing our feature articles by subject, author, and other headings.



(especially if he likes to poke!)

Window cartons are no snap – especially if they tend to snap when people poke at the merchandise inside.

But new super-clear 75BF PLIOFILM makes peeking a pleasure for shoppers who like to see goods just the way they look when unwrapped—for this new Goodyear film is super-clear, doesn't pucker or wrinkle, provides a perfect showcase for fine, fresh products.

AND IT PROTECTS THEM!

Among transparent films, none safeguards foodstuffs with all the protective qualities displayed by PLIOFILM: (1) Tough, it is extremely puncture-resistant (2) Dimensionally stable, it won't crack or wrinkle when humidity changes (3) Flavor protecting, it has moisture-resistance to seal in flavor, freshness and quality (4) Machinability, it adapts perfectly to automatic packaging machinery.

GET THE FACTS—see how greatly this new PLIOFILM can serve you, at such low cost! Write the Goodyear Packaging Engineer, Goodyear, Packaging Films Dept. G-0452, Akron 16, Ohio.

GOOD THINGS ARE BETTER IN

Pliofilm

GOODYEAR PACKAGING FILM

Pliofilm, a rubber hydrochloride—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

The growth of the packaging field and the growth of supermarkets have been very closely allied. I don't know which sparked the development, but certainly they are closely tied together. Let's say the growth of the supermarket was a merchandising revolution accompanied by tremendous advances in packaging and, in particular, improvement in package appearance.

Will further development in merchandising be sparked by technological advances in packaging and preservation? I think so.

Many packagers today are looking for means of increasing shelf life and levelling out production even though sales may be cyclical. These manufacturing and packaging problems will have an increasingly greater effect on sales.

For instance, many bakers today freeze a portion of their production and thaw it out when they need it for distribution to retailers. This enables them to make longer production runs on some specialty items, with an accompanying lower unit cost. Or, the weather might change after the baking has started, and the baker believes that not as many women will be shopping, so he freezes his excess production and holds it for later sale. Some candy manufacturers are doing the same thing — freezing a portion of summer production, when sales are low, and holding it for fall and winter, when sales are higher.

Vacuum packaging is an example of a packaging development that improves shelf life.

A development that will give both these advantages, and many more, is the preservation of food by atomic radiation. Much work is being done on this in the research departments of large packagers and by the Army Quartermaster Corps. This development could, and probably will, change all package requirements and set up entirely new sales outlets for packaged foods. All decay bacteria in food are destroyed by short exposure to atomic radiation and, when packaged so that bacteria are kept out, will last indefinitely.

In discussing this with Clarence K. Wiesman, of Armour & Co., he pointed out that by today's techniques meat preserved this way lost flavor and appearance — and I believe this is true of all food products. It is highly probable that these drawbacks will be eliminated because of the intensive efforts to solve them. This type of preservation would have a great advantage over frozen food, for instance, as it would eliminate the need for refrigerated trucks and show cases.

When preservation of food by atomic radiation is perfected it is bound to have a big effect on packaging. It could change many markets for converters and manufacturers of packaging materials and packages. I have been told by manufacturers of flexible packages, paperboard packagers, and glass containers that each expects his particular type of package to profit most when preservation by atomic radiation is a commercial process.

This type of packaging and preservation is just a few years away, and it may very well have a revolutionary effect on both packaging and distribution.

Angus J. Ray
Publisher

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Packaging Engineering is published monthly by Angus J. Ray Publishing Co., 1791 West Howard Street, Chicago 26, Illinois. Angus J. Ray, president; R. B. Holmgren and I. F. Megargee, vice presidents; James G. Culbertson, secretary and Ethyl K. Ray, treasurer. Please address articles for publication and correspondence regarding the editorial content to the editor. Statements and opinions expressed in articles and editorials are those of the respective authors, for which Package Engineering assumes no responsibility.

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Accepted as controlled circulation publication at Aurora, Illinois.

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The successful introduction of a new drug product is vitally important to Abbott Laboratories. That is why Dobeckmun Durafilm was selected for their DAYALETS®. Durafilm's moisture protection plus transparency delivers these potent new multivitamins to the medical profession in perfect condition.

Packages for performance...

Dobeckmun Durafilm offers special advantages in the precision with which it can be engineered for each product's needs and in its outstanding performance on packaging machinery.

For small hardware, industrial and electrical parts Durafilm provides instant identification, durable toughness, protection from rust and corrosion.

For foods and liquids... for countless drug products, this lamination or extrusion of plastic films ensures meticulous protection and extra selling power. It is moisture proof, heat sealing and of sparkling transparency and can be vividly printed to carry your brand name and sales message direct to consumers.

The Dobeckmun Company,
Cleveland 1, Ohio • Berkeley 10, California
Offices in most principal cities

New Machines Cut Costs of Automatic Packaging

Triangle packaging machinery is designed to save you money. It's built to *pay its own way* by providing the user with a sensibly engineered, dependably efficient means of meeting ever increasing labor costs through automation.

From a cost standpoint . . . consider these machines, look over their standout features then write for details — you'll be amazed at the savings you can get for your investment:

BAG MAKER, FILLER and SEALER

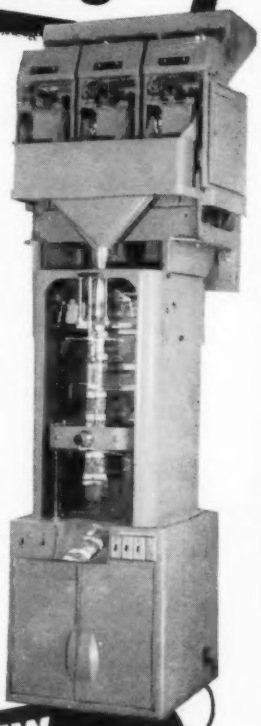
The new Triangle Elec-Tri-Flex automatically makes, fills and seals 30 to 50 bags per minute from roll stock. It's a money maker that can pay for itself *in one year's profits* from as few as 3000 bags per day, but, depending on need, can turn out as many as 3000 bags per hour. You get guaranteed accuracy because it *comes equipped* with dependable Elec-Tri-Pak net weight scales. Form the package, fill and seal *any dry product* — fast and at higher profit . . . with an investment even the smallest operator can afford.

TOP and BOTTOM CARTON SEALER—FILLER

The new Triangle Flexi-matic automatically forms, fills and seals, up to 50 cartons per minute. Exceptional versatility is its standout feature. Handles smallest to largest carton and with welcome ease and speed of changeover. The first and only machine of its type that is practical and profitable for small as well as large packaging operations. Returns handsome profit on 4000 cartons per day but will handle up to 3000 cartons per hour, depending upon needs.

SIMPLICITY of operation and maintenance coupled with dependable day to day output is the answer to low cost packaging. Triangle builds the machines that put *profit in that picture* for packaging dry, semi-liquid and liquid products into all styles of consumer-type packages.

Compare before you buy and be sure to see Triangle literature before you do. For complete information, state your requirements and submit sample filled packages.



TRIANGLE PACKAGE MACHINERY COMPANY

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NEW ELEC-TRI-FLEX Bag Maker—Filler—Sealer

NEW FLEXI-MATIC Carton Filler & Sealer

Since 1923

TRIANGLE

manufacturers of automatic package machinery:

WEIGHERS • FILLERS • CARTON SEALERS • POWDER PACKERS • WRAPPING MACHINES

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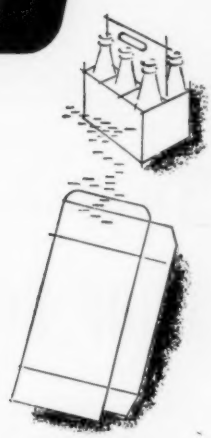
SPEED KEYED TO YOUR CARTON-MAKING OPERATIONS

SWIFT'S NEW SPECIALIZED RESIN ADHESIVES FOR FOLDING CARTONS



Efficiency in folding carton manufacture requires more than just speed—it requires the right speed for the job. Swift's new specially compounded resins include super speed adhesives for straight line work, speed-keyed adhesives for right angle work.

Whatever your requirements, there's a Swift adhesive tailored for your job. Ask your nearby Swift Adhesive Specialist for complete data or write direct for further information. Swift & Company, Adhesive Products Department, Chicago 9, Illinois.

Swift
102ND YEAR

To Serve Your Industry Better

WITH THESE ADHESIVE PRODUCTS

Resins and Rubbers in Emulsion or Solvent • Dry, Liquid and Flexible Animal Glues • Industrial Bonding Compounds • Liquid Dextrin Adhesives

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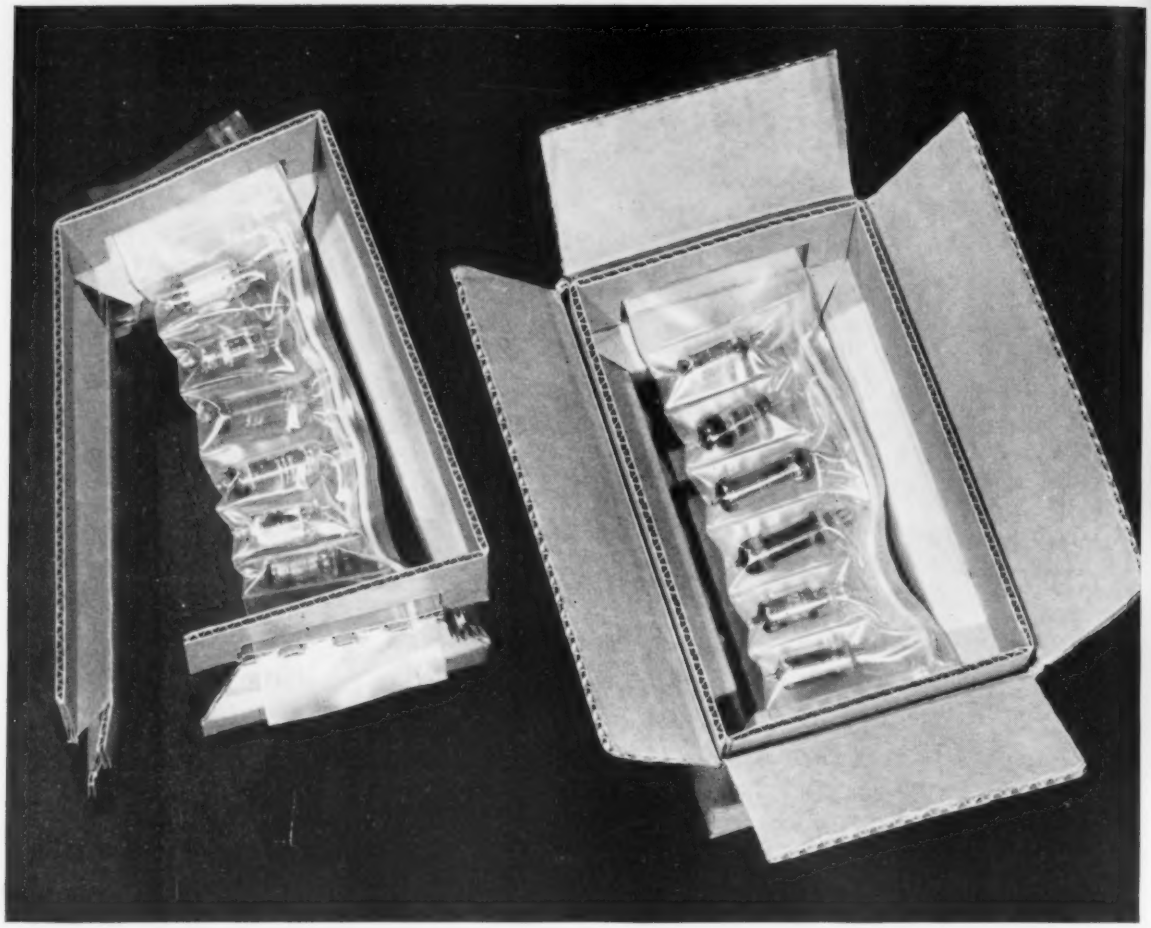

Tough, flexible polyethylene film absorbs shock in the new "Swing-Pack" package for fragile parts.

Polyethylene film makes possible

unique new "Swing-Pack" for fragile parts

Film made of BAKELITE Brand Polyethylene is the key to this new lightweight suspension packaging idea developed by Polyfab Company, Los Angeles 65, Calif.

The packaging of radio tubes is an excellent example of how it works. The tubes are enclosed in pockets formed by heat-sealing seams in an envelope of polyethylene film. The whole filled strip then swings suspended from a die-cut and scored insert in a corrugated box. The unit saves weight, is dustproof and shock absorbent . . . easy to assemble and requires less storage area than conventional packages.

Investigate all the ways film made of BAKELITE Brand Polyethylene can help you—in manufacturing, in shipping, and in building bigger retail sales. See your packaging supplier, or write Dept. YM-157.

IT PAYS TO PACKAGE IN FILM MADE OF

BAKELITE BRAND

POLYETHYLENE

UNION CARBIDE

BAKELITE COMPANY, *Division of Union Carbide Corporation* UCC 30 East 42nd Street, New York 17, N. Y.

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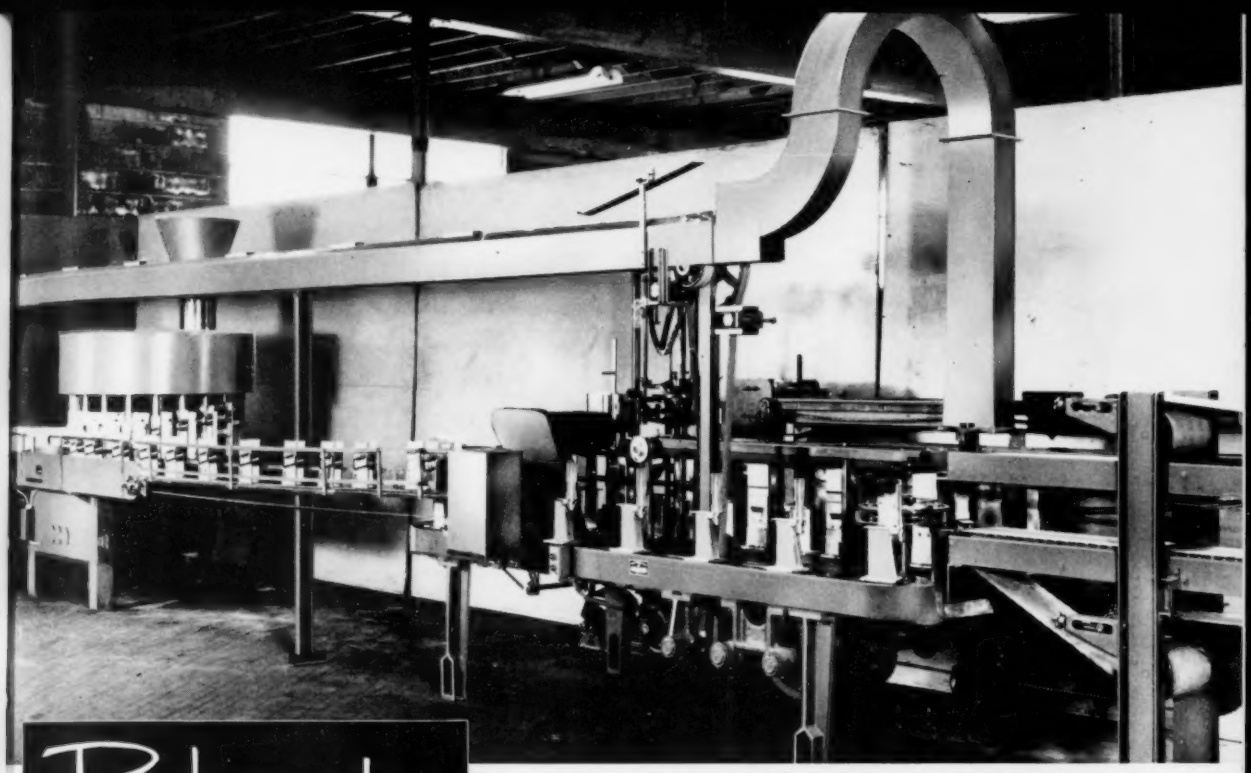
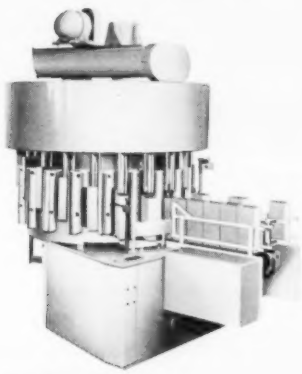
Circle No. 208 on Card →



Packomatic
T.M. Reg. U. S. Pat. Off.

This complete filling-packaging line, including carton sealer-feeder, telescoping volumetric filler and top-bottom case gluer takes up less than 1000 square feet of floor space.

CUSTOM ENGINEERED MACHINES FOR SEMI AND FREE-FLOWING PRODUCTS



If you package dry, semi or free-flowing products—flour, detergents, soda, cleansers, insecticides, soap powders—if you want to fill those hard-to-handle products the dustless way, let a Packomatic sales engineer show you the exclusive method of flowing products into containers—round or rectangular. At speeds in excess of 100 units per minute, Packomatic telescoping volumetric fillers and augers are accurate, fast and especially economical to own. And automatic, of course.

MODEL TVF

Approximately 4 ft. in diameter, equipped with optional direction in-and-out, or straight-line feed. Speeds: round cartons, 60-175 per minute; rectangular cartons, 60-120 per min. Custom models available.

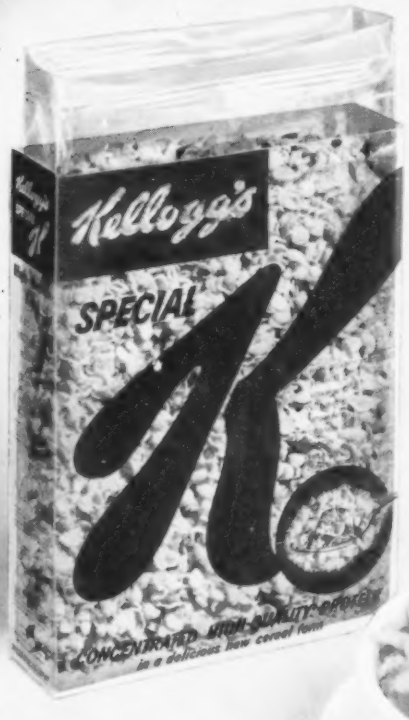
AUGER PACKER-WEIGHER

This turret-type machine handles flour and other soft-powdered products in containers from 6" to 22" high. Automatically fills and accurately weighs from 1 lb. to 25 lbs.

J. L. FERGUSON COMPANY • JOLIET 1, ILL.

New York, Chicago, Cleveland, Boston, Tampa, Baltimore, Portland, Denver, Los Angeles, San Francisco, Seattle, New Orleans, Louisville, Kansas City and all principal Canadian cities.

X-Ray photo of Special K cereal box



Inside Story on Special K Protective Packaging

Kellogg's new protein potent Special K cereal has a "waxtite" inner bag that guards its oven-fresh flavor. This bag is fabricated from Rhinelander glassine waxed by the Kellogg Company. It insures the just-right crispness that must be nicely balanced to prevent rancidity development and moisture-vapor transmission.

Waxed glassine performs this job successfully and inexpensively. Moreover, it has excellent folding qualities which enable the package to be reclosed after part of the contents has been removed.

These and other properties, such as resistance to grease, shortening and oils, make Rhinelander glassine paper an ideal protective medium in packaging many perishable food products.

Write for full information and samples—stating your packaging application.

RHINELANDER PAPER

Rhinelander Paper Company, Rhinelander, Wisconsin

Subsidiary of St. Regis Paper Company

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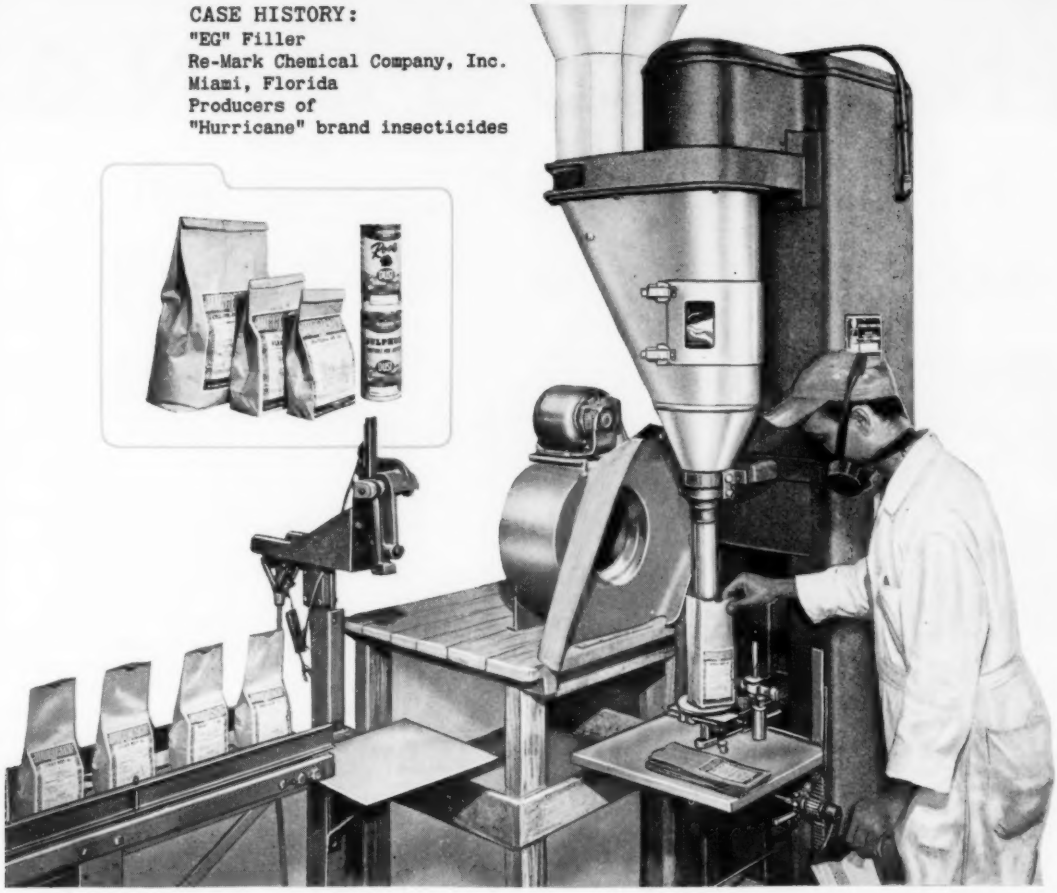
CASE HISTORY:
"EG" Filler
Re-Mark Chemical Company, Inc.
Miami, Florida
Producers of
"Hurricane" brand insecticides



Packaging costs Slashed on both long runs and rush orders

"We have obtained improved production from the Stokes & Smith "EG" Filler and it has substantially reduced our costs of packaging insecticides," reports Mr. Paul Marks, the president of Re-Mark Chemical Co.

"It is very versatile. We can change from one type of packaging to another with little delay. It is excellent for long runs and equally good for filling rush orders. I know of no other equipment so accurate and easy to handle or so well suited to our needs."

Because dust insecticides are non-free flowing, the "EG" auger principle provides the distinct advantage of extreme accuracy and speed in filling both bags and canisters in from one to ten pound packages. The filler operates from 5 to 18 hours a day and occasionally is put on a 24-hour, three-shift day without maintenance stops.

Filling is changed as often as five times a day for different products and package sizes. And because of the "EG" Filler's speed and quick changeover, it has not been necessary to warehouse large stocks since rush orders can be handled economically.

Why not discover how the versatile "EG" Filler can cut your packaging costs? Write to:

STOKES & SMITH CO.

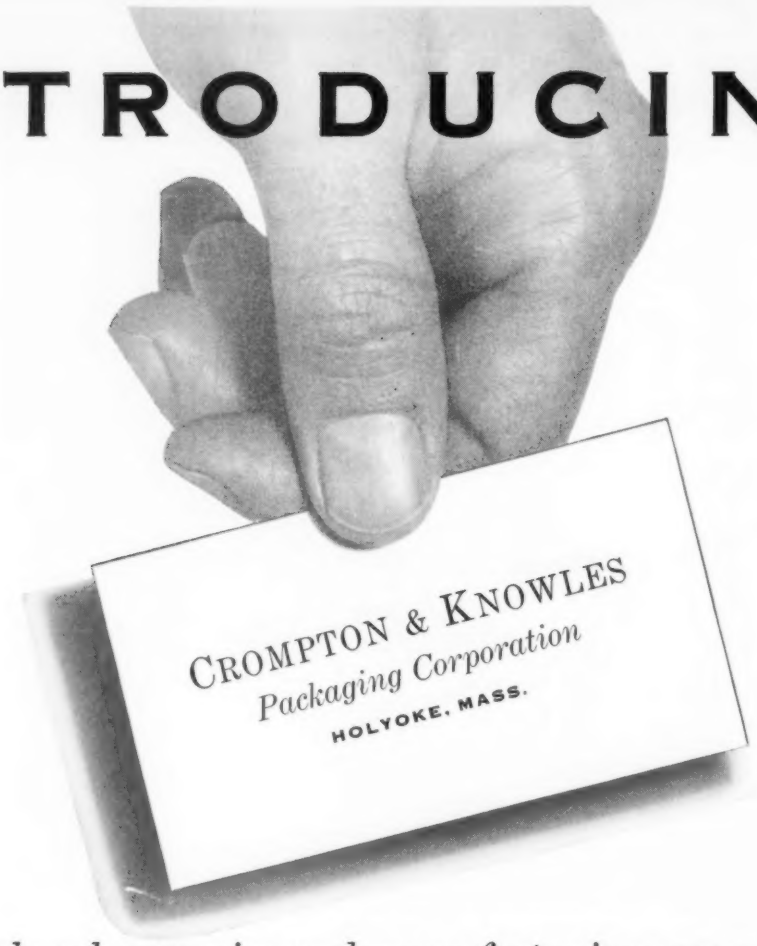
4994-U SUMMERDALE AVENUE, PHILADELPHIA 24, PA.

Pacific Coast: SIMPLEX PACKAGING MACHINERY, INC., 534—23rd AVE., OAKLAND 6, CALIF.

fmc

SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION

INTRODUCING



A single sales, service and manufacturing organization

Combining

WRAP-KING overwrapping machines

RUSSELL can handling equipment

KLEAR-PLASTIC rigid plastic containers and manufacturing machinery

The new Crompton & Knowles Packaging Corporation offers you the products and services as well as engineering, research and development facilities of three leading packaging industry names PLUS the production capacity and machine building experience of Crompton & Knowles, one of the nation's oldest and largest machinery manufacturers.

This new organization offers you national sales and service together with new and improved products for your packaging operations. Crompton & Knowles Packaging Corporation products can help you get greater production and maximum versatility at lowest possible costs. We invite your inquiry.

Products Now Available

WRAP-KING — versatile overwrapping machines for individual and bundled products — for all types of film.

RUSSELL — can handling equipment . . . case packers (filled and empty) . . . gluers and compression units . . . case openers and positioners . . . tray positioners and packers.

KLEAR-PLASTIC — rigid plastic containers, trays and lids.

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Bracon | SQUEEZE-TO-USE PACKAGING

How to evaluate your product for Polyethylene TUBES...BOTTLES...CANS

Polyethylene as a packaging material has found great success in many markets; drug, cosmetic, household chemical, industrial . . . even *food*. So how do you prepare for the time when management asks *you*, the *packaging engineer*, to evaluate their product in terms of these unique containers . . . How do you decide if your product is suited to polyethylene?

First, consider that polyethylene as a base compound has been constantly improved since its first appearance. It is odorless, imparts no taste and remains chemically inert. *More*, when fabricated into containers, polyethylene is dentproof, unbreakable, light in weight and, in tube form, refuses to roll up into a misshapen

BRACON tubes, bottles
and squeeze cans suit all types of products

mass which obliterates your brand name or directions for use. BRACON tubes, bottles and cans can be attractively printed in many permanent colors and you may choose from a variety of fitments to obtain the desired action for your product . . . single drop or stream ejection, wet or dry spray, etc.

What then are the shortcomings of this wonderful material? Although polyethylene has a very low permeation rate, it is not a complete barrier and certain substances are absorbed . . . pass through the walls of the container . . . and evaporate. Likewise, formulas which are exceptionally sensitive to oxygen transmission may be affected if the correct container is not selected.

Test packages
are carefully stored and indexed

Bradley Container Corporation has developed a special barrier coating which may be adhered to the inner walls of BRACON tubes to overcome both these objections and it is hoped that similar protection will be available in a short time for squeeze bottles and cans.

In every case, BRACON laboratory technicians will thoroughly analyze your product before passing on its packageability in polyethylene. In this analysis, each member assumes the role of manufacturer and/or consumer in his criticism, as well as rigidly examining the product and package from a technical standpoint.

What do you do to start this evaluation? Send Bradley at least a half gallon of your product in bulk (more for 2ME), attention "Sales Service Department". Be sure we know the type and size of container you prefer; tube, bottle or can, and the type of squeeze action you desire.

We encourage your doing tests concurrently with our own. In this case be sure to send sufficient quantities of your product and we'll return filled samples for inspection and testing at your plant. We will furnish test procedure data when requested.

Laboratory samples
are checked to determine weight loss, etc.

All data
is computed for study by the panel

Bradley Container Corporation will make an intensive study of your liquid, cream or powder. In about six weeks we will report test results having checked packageability characteristics, i. e. Collapse, Puffiness, Staining, Oil Film, Consistency Change, Flavor Change, Color Change, Odor Change, Emulsion Break or Weight Loss.

That's it! . . . you'll have complete facts on packageability *and* you'll be starting your product off in the most functional container. yet!

Organoleptic panel
make final analysis and recommendations

BRADLEY CONTAINER CORPORATION

A subsidiary of American Can Company

MAYNARD, MASSACHUSETTS

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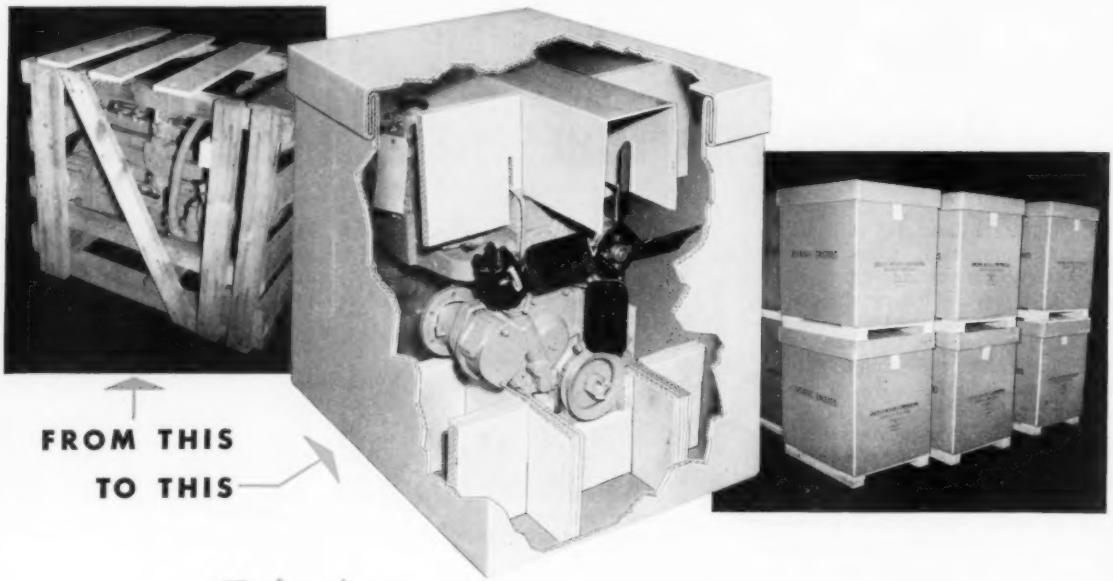

Result: *Inland* SAVED *100 Pounds* SHIPPING WEIGHT PER UNIT for this Customer*

● This 525-pound, 6-cylinder gasoline marine engine was shipped for years in the bulky wood crate shown above, which added 125 pounds to the shipping weight. But when Inland engineers were put on the job, they found the way to ship these same engines *more safely*, in corrugated containers weighing only 25 pounds, complete with bottom pallet.

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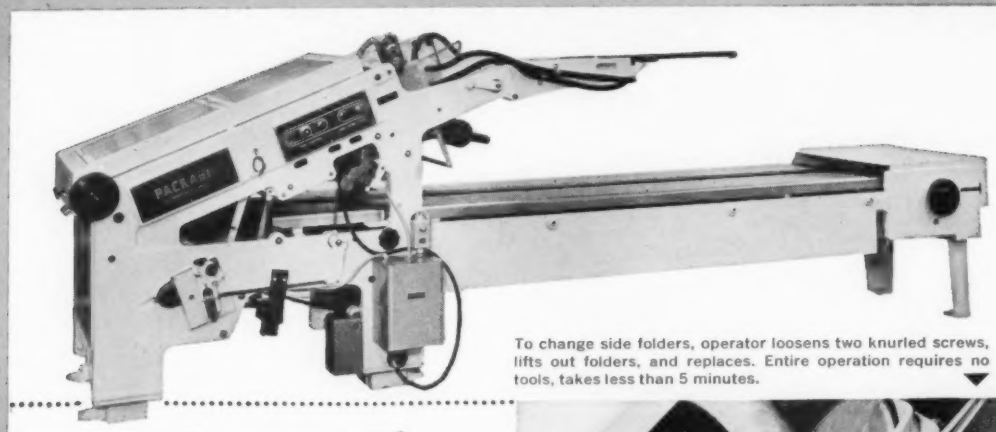
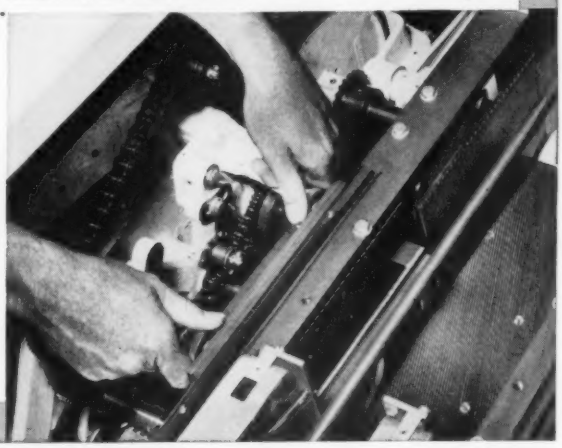
HOW ARMOUR STAR GETS QUICK SIZE CHANGES



To change side folders, operator loosens two knurled screws, lifts out folders, and replaces. Entire operation requires no tools, takes less than 5 minutes.



U-61 GIVES MAXIMUM FLEXIBILITY

With the U-61 Double Point Folding Machine wrapping its packaged meats, Armour can change sizes quickly and easily. All that is required is a simple replacement of side folders, which the operator does without tools. Handwheel adjustment of paper width automatically adjusts electric eye registration, too, for scanning head is mounted to move with paper side guide.

The U-61 handles slight differences in package heights automatically, allowing for ⅛" variations. Straight roller discharge (shown above) moves finished packages off the machine onto a belt or table. Optional right angle side roller discharge can be set on the same side as the operator, or on the opposite side.

With a Model U-61, you can wrap a size range from 4" to 16" in length, 3" to 6" in width, and 1" to 3" in height, using cellophane. Wax paper or foil may also be used, but require special refrigeration at discharge as shown in illustration. Speed range is from 15 to 40 a minute. To find the cost-cutting advantages the U-61 can bring to your operation, contact your nearest Package representative.

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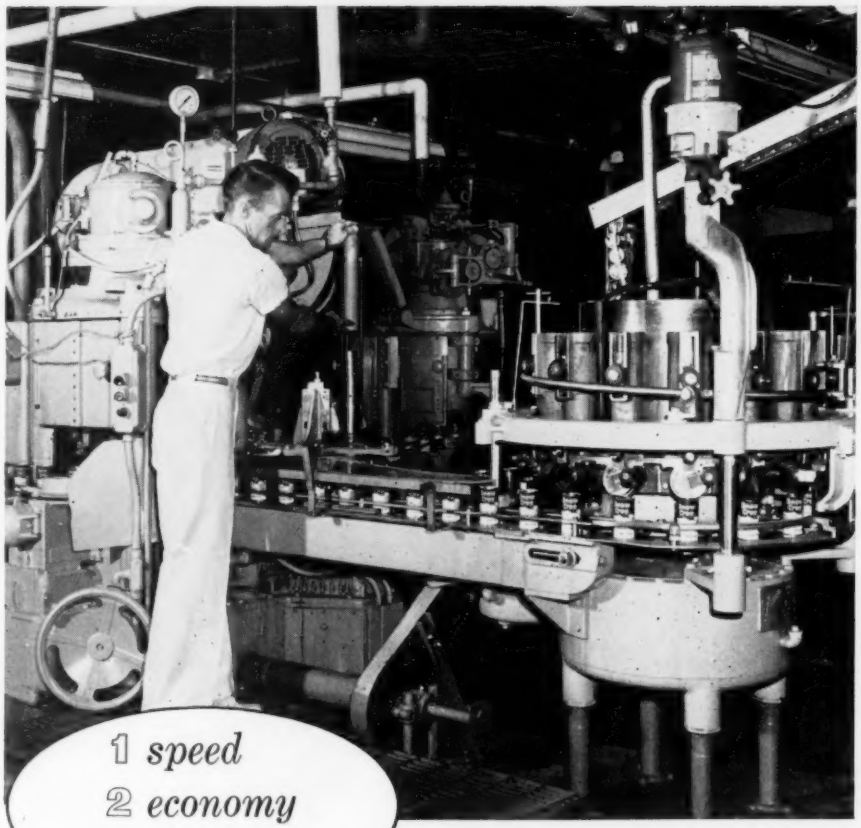

1 *speed*
2 *economy*
3 *accuracy*

How to put ALL 3 into your food packaging

If you're packaging a *viscous* or *semi-solid* product, Pfaudler piston fillers can help you do it more quickly, more economically, and with greater accuracy. Here's why!

Speed. You just can't get the same filling action from any other piston filler. Pfaudler's *patented* two-port rotable valve, automatic take-up, and cam control give you filling speeds up to 1000 containers per minute! Speed depends, of course, on filler model, container size, and the fluidity of product.

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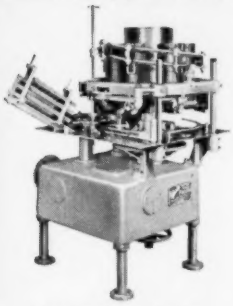
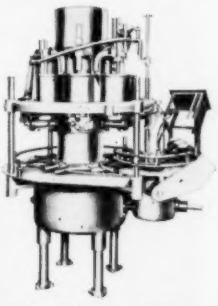
You can put all three of these benefits into *your* food packaging with one of the five available models. To find out which model best suits your product, contact your Pfaudler representative.

Or drop us a line. Just ask for Bulletins 911 and 911-S.

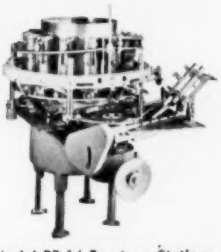
Five standard models of Pfaudler rotary piston fillers



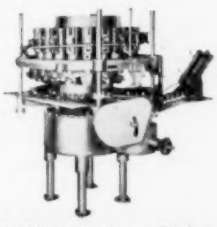
Model RP-6 Six Stations



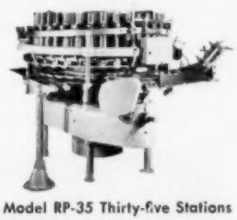
Model RP-7 Seven Stations



Model RP-14 Fourteen Stations



Model RP-21 Twenty-one Stations



Model RP-35 Thirty-five Stations

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C. L. Brickman is a graduate of Defiance College, and of Case Institute of Technology with a B.S. degree in chemical engineering. Since 1953 he has been associated with Standard Packaging Corporation. Prior to this, his connections were with Benj. C. Betner Company, Thomas M. Royal & Company and Goodyear Tire & Rubber Company. His affiliations include American Chemical Society, Rubber Division A.C.S., and TAPPI.

Any number of companies have learned that the solution of a packaging problem predicates on knowing enough about the product. In this landmark article, Mr. Brickman discusses the product evaluation process and explains the reasons underlying the points of special attention. His supporting data are of particular value to anyone concerned with flexible packaging material selection and application.

Evaluating the packaging requirements of a product

By Carl L. Brickman,
Manager, Product Testing Laboratory, Standard Packaging Corporation, Clifton, New Jersey

Strictly speaking, the process of evaluating or measuring the packaging requirements of a product is not packaging, but such evaluation is indispensable to the development of a technically satisfactory, as well as economic, package — particularly in the field of flexible packages. As a rule, the company that is seeking to develop a flexible package for its product too often lacks the accurate quantitative knowledge of exactly what protection is needed to give the desired shelf life to the product.

Required shelf life is, or should be, specified by the sales department. It is not the function of the package engineer to decide how long the shelf life should be; rather it is the package engineer's job to build a package which has the specified shelf life. The very first step in developing or engineering the package should be the evaluation of the product's needs, but, unfortunately, this job is seldom done by the company which is producing the product.

The time honored procedure is usually to put the problem up to the supplier of the packages who, in turn, must make the lengthy laboratory studies before he can safely suggest a package specification that will prove satisfactory. Meanwhile the buyer's purchasing department is likely to become vociferous about the delay, and it's all because the buyer does not know what he needs, and does not or cannot specify what protection his product requires.

What Are Packaging Requirements?

Briefly stated, they include the following, sometimes plus other properties:

(a) The maximum percentage of moisture-loss or moisture-gain to be permitted during the shelf life that is specified and will yield a product that is satisfactory at the end of the period.

(b) The maximum amount of loss or gain of gases (frequently the gas is oxygen) to be permitted during the specified shelf life, and yet have a satisfactory product at the end of the period.

(c) Maximum amount of grease (or fat) loss during the specified shelf life and yet have a satisfactory product at the end of the period.

(d) Maximum amount of light that the product can endure during its specified shelf life.

(e) Maximum amount of odor pick-up or loss that the product can endure and still have a satisfactory product at the end of the specified shelf life.

Possibly there are others.

A further important property of the product to be packaged is the volume of the voids or the amount of air in the interstices of the product, for these voids may contain air which consists of about 20 per cent oxygen — the enemy of flavor. Furthermore, the air in the voids will contain variable amounts of water vapor. Cases have been known where

TABLE I

Pressure in mm of mercury exerted by water vapor to enter or leave the product in the package.

Product	Equilibrium humidity when packaged, %	Water vapor pressure inside package, mm	Water vapor pressure outside package, mm	Vapor pressure differential, or flow, mm
Package exposed to atmosphere at 80 deg. F. and 23% R.H.				
1. Syrup	89	23.4	6.0	−17.4
2. Dried Apples	78	20.5	6.0	−14.5
3. Cigars	68	17.9	6.0	−11.1
Package exposed to atmosphere at 80 deg. F. and 50% R.H.				
4. Iodine Sanitizer	15.5	4.0	13.1	+ 9.1
5. Cough Drops	12.0	3.2	13.1	+ 9.9
6. Hard Candy	22.0	5.8	13.1	+ 7.3
7. Corn Chips	22.0	5.8	13.1	+ 7.3
8. Dried Milk	14.0	3.7	13.1	+ 9.4

(+) means product will gain moisture. (−) means product will lose moisture.

the manufacturer of the product to be packaged was licked before he started, just because of the volume of air in the interstitial voids.

All the foregoing properties of the product ought to be known in quantitative terms by the company which plans to package its products. But, human nature being what it is, the little matter of product evaluation is frequently left to some vendor of packages who may, unhappily, be unaware or incapable of the need for accurate measurements of these fundamental needs, and may even recommend a package or material that is unable to meet the needs of the product.

Again, it is reiterated, this is not packaging; but such accurate measurements are indispensable to the development of a satisfactory and economic package. No engineer, mechanical or otherwise, who is worthy of the name, would ever guess at loads, stresses, forces, speeds, etc., if they can possibly be measured or calculated. If these requirements cannot be measured, then your engineer must estimate them and then play safe by introducing a large factor of safety — perhaps much larger than would be necessary had he possessed in advance the definite quantitative figures of what was needed. This can lead to oversized structures. Or, in the case of packages, it can lead to overpackaging. Or, as it sometimes happens, if the guesses are very wrong it can lead to underpackaging.

Published properties of films are valuable information, to be sure, but such properties must be used intelligently and with a full knowledge of how the requirements of a package may be affected by such things as the shape of the package. For the greater the ratio of the area to its contents, as is found in small packages, the greater the need for barrier properties to protect the same product.

Hence, what experience may have shown to be satisfactory in a large package may prove to be inadequate for protecting the contents of a much smaller package of the same product. Also, the shape of the package is another factor of considerable importance, for the packaging requirements of a small flat package may be more rigorous than those of the same product in a cubical or cylindrical package made of the same material and enclosing the same product. The reason here is the same as before: the ratio of area to contents is greater in the flat package.

Films vs. Laminates

Single films have a large variety of uses but do not always meet the requirements of a package. By combining different materials in the form of laminations, possible deficiencies of each film may be compensated. The manufacture of such combinations is done by the converter. In our company we have the following single films and materials that we use for the possible needed combination: Paper, cotton, nylon, aluminum foil, cellophane, cellulose acetate, styrene, vinyl chloride, Pliofilm, saran, polyethylene (low, medium and high density) both as films and resins, polyvinyl alcohol as film and resin,

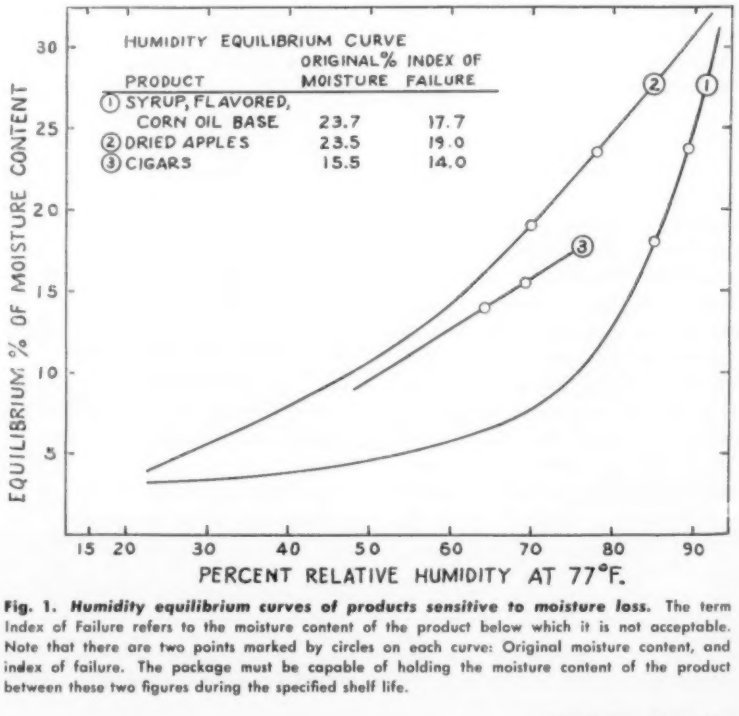


Fig. 1. *Humidity equilibrium curves of products sensitive to moisture loss.* The term Index of Failure refers to the moisture content of the product below which it is not acceptable. Note that there are two points marked by circles on each curve: Original moisture content, and index of failure. The package must be capable of holding the moisture content of the product between these two figures during the specified shelf life.

polyester, metallized polyester, and fluorocarbon. This large variety calls for a great degree of flexibility in various equipment, particularly where it also involves printing, coating and adhesion. Many of the properties of laminations can be modified merely by changes in the basis weight or caliper, or amount of coating or adhesive, but each construction requires careful tabulation of physical, mechanical or chemical properties, printing or sealing characteristics, special features and suggested uses.

Such a varied line of packaging materials is essential and justified. Just as one color of cloth will not suit every man, so will not every material or combination of materials answer the ever more complex requirements of some particular product as to desired protection and cost.

Evaluating The Product's Needs For Protection

The development of the quantitative information about the specific needs in the way of protection of the contents of the package is really the responsibility of the manufacturer of the product to be packaged but, as more often is the case, it seems to be inevitable that the supplier must do it for the user. Studies done in the laboratory to determine the product requirements are not really packaging yet they are the indispensable prerequisite to the scientific development of a successful package.

To repeat: If data are not obtained to give concrete figures on the degree of protection required, any guessing as to the requirements may lead to overpackaging or underpackaging of the product for a specified shelf life. Such guessing is likely to be someone's estimate of a material which will meet a price rather than meet a need.

If the guess is wrong, and the material recommended fails to meet the needs of the product, the salesman of the film or laminate is likely to be *persona non grata* on his next visit, and no repeat order is forthcoming. On the other hand, if the customer makes the decision for a material that test data of the product's requirements show to be inadequate, and later finds the cost of claim adjustments may be uncomfortably large, the packaging material salesman may still have the opportunity to get an order.

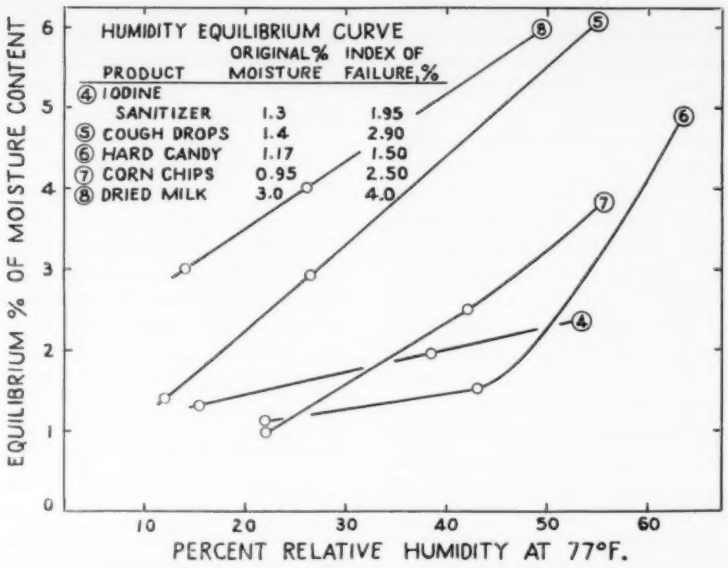


Fig. 2. ***Humidity equilibrium curves of products sensitive to moisture gain.*** The two points on each curve that are circled indicate the initial moisture content of the freshly manufactured product, and the moisture content where the product becomes unacceptable. Index-of-Failure points for 4, 6, and 7, being close to 40% R.H., are not as critical as 5 and 8 where the index of failure is about 26%. The lower the R.H. at the failure point, the greater the degree of protection required.

To illustrate: Assume that material X is slightly cheaper than material Y, and that the customer has been told that the number of leakers may be 5% to 10% higher in packages made from material X. The customer insists on material X notwithstanding, and later finds that the cost of claim adjustments that he has had to make on returned goods has been more than if he had specified material Y. In such a case the salesman is not the culprit and his recommendations are likely to be followed in future dealings.

In the laboratories of the larger manufacturers of foods, chemical specialties, etc., where trained personnel and adequate facilities for evaluating a product's requirements are available, complete studies will be made on samples of materials to determine the adequacy of the material to meet the requirements. It is also possible that such companies may write up a complete specification for a material or laminate if the existing standard products are not suitable.

Such companies often find it feasible to obtain roll stock from a converter and fabricate their test packages on their own automatic bag or pouch making and filling machines in order to eliminate as many variables as possible when determining the specifications for a packaging material.

Another method sometimes used by the larger customers is to have such test packaging done by a contract packager who is equipped to do a complete operation from roll stock made to the customer's specifications. This is often practical when the customer is developing a new product and wants limited quantities for test-marketing or for samples.

The medium or small sized manufacturer of foods, chemical specialties and the like, has limited means for conducting packaging studies and depends on the converter for pertinent information. Or he has recourse to the independent laboratory. There are, however, some manufacturers who will start production of a product in a packaging material on the basis of limited or only superficial tests. This creates the job of the

editor of questions and answers departments in numerous magazines in which he gives the possible causes of failure, why the appearance of the packaging material or product is affected, or why the shelf line has proved inadequate. (The need for tact and diplomacy, however, precludes assessing the basic cause of the problem; the failure to make adequate studies prior to going into production).

The converter with a research and development department will have on hand case histories on the suitability of a material for packaging a particular product, or class of products such as cheese, luncheon meat, fish, frozen foods, etc. These often will have required many months of realistic testing to examine the many factors affecting shelf life under the conditions of storage and handling in actual use. Such studies may require: Determining oxygen transmission rate, water vapor permeability, color changes, organoleptic evaluation, suitability of vacuum or gas packaging, packaging on customer's equipment to establish any special handling or sealing requirements, field tests.

It must be realized, however, that products in the same general class can vary in some important feature—constituent, formulation, or method of preparation — and that enough of such variation may be present to necessitate a complete re-evaluation of the product's needs and new or different packaging materials.

It should be obvious that it takes much time for a thorough investigation of product properties as affected by the packaging material under certain exposure conditions. There is no short cut method at the present time.

Limitations Of Accelerated Tests

To save time in performing the foregoing lengthy tests, it is often thought that some form of accelerated test will give quick answers. It may be practical in evaluating the packaging material, and it is often done. Thus, cyclic tests in alternate high and low temperatures or humidity, vibration tests, tumbling tests, and the recording of the resulting appearance, and the adhesion of coatings, plies, and the condition of the heat seal, will help to set the standards on how well the lamination holds together, or show if it is free from defects.

But the use of accelerated tests on the product itself is an entirely different matter. Food that is frozen or refrigerated hardly lends itself to any other form of testing. Products known to be adversely affected by temperature above or below normal must be held within the normal temperature range for evaluation of their requirements.

To run a test at some elevated temperature with accompanying high or low relative humidity may reveal varying rates of weight gain or loss, but to arbitrarily state that a number of days in such a test is equal to a number of months in anticipated use without any field studies by which to correlate the data is wishful thinking and is not scientific.

Tests Which Aid In Evaluating Material Suitability

In foods or chemical products where the shelf life is principally affected by loss or gain of moisture, much time and effort can be saved by first determining the degree of protection that the product requires so that the materials having the required WVTR characteristics are selected at the outset for the packaging test.

By first determining the degree of protection needed, information is also gained about the care needed in handling the product during the packaging operation, particularly if it is a hygroscopic product. If the spread of allowable moisture pick-up is very narrow, say 1% to 2%, and if this occurs between 15%, and 30% relative humidity, it is obvious that handling the product in a room at 40% to 60% relative humidity can seriously affect the resulting shelf life, regardless of how it is packaged.

The preceding condition is often encountered, and a packaging material having a WVTR which would hold the moisture within the limits specified for the required shelf life would be declared unsatisfactory, whereas the original moisture content of the product at the time of packaging is already critical and has approached the failure point.

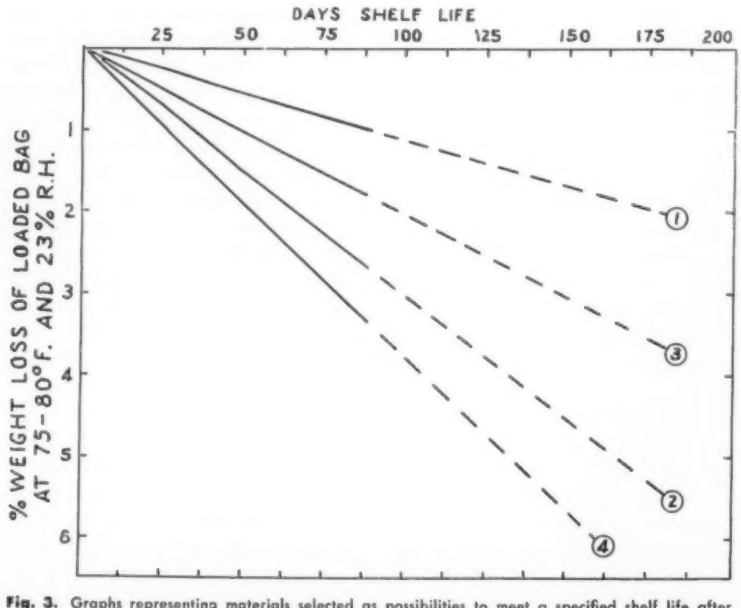
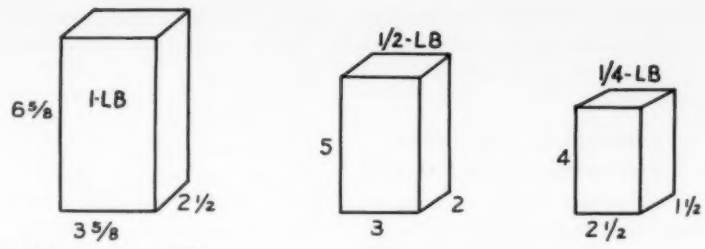


Fig. 3. Graphs representing materials selected as possibilities to meet a specified shelf life after the moisture equilibrium curves have been studied. Tests are run for 90 days. (There is no short cut method — yet). These data must be carefully considered in connection with the environment in which the package is to be exposed in commerce. In this example, the maximum tolerable moisture loss was 4%, showing that Mark 1 and Mark 3 were satisfactory barriers. Mark 4 would be suitable only in a hot, humid climate such as Condition II (see text).



CU.IN.	60.	30.	15.
AREA, SQ.IN.	75.2	62.	39.5
SQ.IN./OZ.	4.7	7.75	9.87
SQ.IN./CU.IN.	1.25	2.07	2.63

Fig. 4. Illustrating the relationship between the size of a package and its superficial area. Better barrier properties are needed, the smaller the package, because the ratio increases as size is diminished. If a package holding 1 lb. of product has proved to be satisfactory, it does not necessarily follow that the same packaging material will serve equally well in a smaller package, for a ¼-lb. package has double the exposed surface area per pound of contents compared with a 1-lb. package of the same product.

The foregoing important information is obtained by finding the relationship between moisture level and equilibrium relative humidity of the product for a specified temperature. Moreover, such equilibrium data define the hygroscopic category in quantitative terms. Examples of the information which can be obtained in this way are given in Table I.

From such data, and knowledge of the original moisture content, the allowable per cent gain or loss, package size and weight, it is possible to calculate theoretical WVTR requirements, and thus indicate the correct material to be used in tests. This is done by the principle that WVTR is proportional to the vapor-pressure gradient across the membrane, or the difference between atmospheric pressure outside and inside the package.

Necessity For Defining Exposure Conditions

When selecting the packaging material for a given job, we must not neglect consideration of what is implied when protection is wanted for a product in national domestic distribution. We need to know the temperature and humidity of the areas in which the product will be stored and marketed over a specified time because knowledge of these factors can be used to calculate the approximate level of protection needed for a given size of unit if the other indispensible data are provided or determined, such as moisture content when packaged, and allowable weight gain or loss.

The United States Weather Bureau is a source of tables of data that give 50-year average figures for temperature and relative humidity in cities throughout the United States. From these data the country can be divided into zones of average conditions. A general classification which has been found useful is the following:

Condition	Region	Av. Temp. & R.H.
I	West North Central, East North Central, Middle Atlantic, and Eastern Seaboard.	Summer months (April — Sept.) 80 deg. F. and 50% R.H.
II	West South Central, East South Central, South Atlantic.	Yearly Average, 85 deg. F. and 65% R.H.
III	Same as (I) above.	Indoor winter (Nov. — Mar.) 80 deg. F. and 23% R.H.

Note: It is also assumed that in the five winter months there are likely to be 30 days when R.H. will rise to 30% to 40% due to precipitation.

Supplementing Calculated Requirements With Test Data

When WVTR requirements are calculated for a specific exposure condition, the product is then tested under the same approximate conditions as a further test of suitability of the package. Permeability is determined by averaging weight loss or gain of duplicate or triplicate samples at stated intervals, and the results are plotted against time. Tests are run for a minimum of 30 to 60 days to establish equilibrium. The slope of the curve at apparent equilibrium can then be extrapolated for any extended time interval. Samples are also opened from time to time if it is desirable to examine them organoleptically, or for any other special quality. In the latter case the number of samples undergoing test for each material must be increased proportionately in order to have enough samples to complete all desired tests.

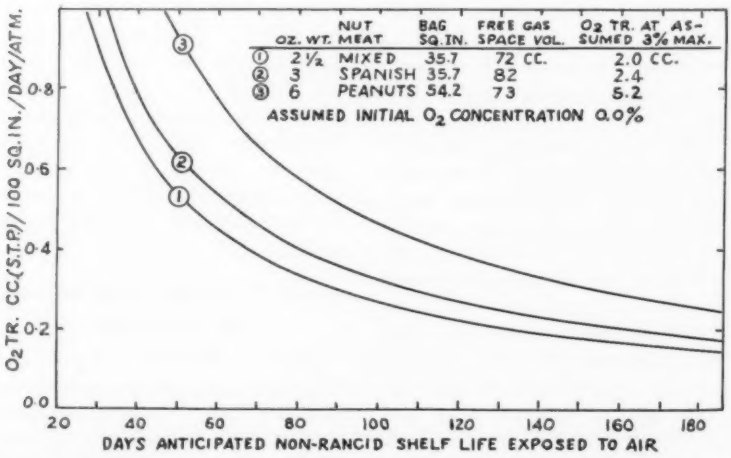


Fig. 5. ***Calculated maximum oxygen transmission permissible for a specified shelf life (small package).*** From these curves, as well as Fig. 6, it is possible to predict the maximum amount of oxygen that may be allowed in a package — any package — of a given size and containing the product specified, and have a non-rancid shelf life for a given number of days. Obviously, very small amounts of additional oxygen will shorten the shelf life.

An example of calculated and test data is given by the following: A liquid, edible product was evaluated to determine the suitable transparent packaging material for packaging ¾ fluid ounces per unit for national distribution with a required shelf life of six months.

Preliminary examination established the bag size, and the moisture equilibrium curve indicated that the original moisture content of the product (23.7%) was in equilibrium with 89% R.H. at 80 deg. F.; also, that moisture loss beyond 4% to 6% was critical in its effect on the desired viscosity of the product.

Calculated WVTR was as follows:

For assumed exposure condition	Calculated required WVTR as gram/100 sq. in./24 hrs. at 100 deg. F. and 91% R.H.
I 6 months at 80 deg. F. & 50% R.H.	0.31
II 6 months at 85 deg. F. & 65% R.H.	0.50
III 5 months at 80 deg. F. & 23% R.H.	0.22

Materials tested at 75 to 80 deg. F. and 23% R.H. had WVTR values as follows: Mark 1 0.27
Mark 2 0.34
Mark 3 0.53

Results on weight-loss tests are plotted in Fig. 3 and extrapolated to six months. The curve shows the suitability of Marks 1, 2 and 3 for all the assumed conditions of exposure, but at 4% weight-loss, only Marks 1 and 3 gave sufficient protection. Mark 4 is suitable only for Condition II (warm, humid areas).

The preceding paragraphs constitute an aspect of package engineering in which use is made of as many factors and studies as will determine, before package-testing, the suitability of the packaging material for the solution of the problem at hand. It saves both time and money. Without such preliminary studies it is entirely possible that a test series may be run that will prove to be valueless.

In the special case where the quality of a product depends chiefly on moisture content, and is adversely affected by a rise in moisture content beyond a specified, known level, accelerated tests can be made under controlled temperature and relative humidity, giving data that are useful *provided* a comparison can be made with observed shelf life in field tests of the same product in the same material.

Problems In Satisfactory Packaging Of Nut Meats

"What's one man's meat is another man's poison" is a true aphorism. Take a little thing like oxygen, for example. We can't live without it, yet it does not always mean life. Many products need protection against it in order to be usable or edible. Even a partial list of things against which oxygen is deleterious is impressive: Rubber, plastics, petroleum, vegetable and animal oils, dry vitamins, dehydrated vegetables, milk powder, dried eggs, cheese, luncheon meats, nut meats — all of which contain fat or other easily oxidizable substances.

In edible products, the greatest effect of oxygen is upon flavor; the fat becomes rancid by oxidation, and the rate of development of rancidity is proportional to the amount of oxygen present. The rate is accelerated by moisture, temperature, and the catalytic effect of light. Oxygen may cause darkening or bleaching of the color of foods. It is the cause of mold growth in Swiss and Provolone cheese.

More can be said about nut meats because they are one of the most widely used food products. Surely the peanut is in everyone's vocabulary along with the idioms, singular and plural. Flexible packages account for the wide distribution of peanuts into every country hamlet. Few people realize that the peanut is in the category of "difficult to package" items for long shelf life in an inexpensive material. Every vendor of packaged peanuts has had his share of returns and complaints of off-flavor, and additional complaints about sogginess from sales in regions of high humidity. These problems can usually be attributed to underpackaging to meet a competitive price.

Shelled and roasted nuts have a high fat content, as dieticians well know when counting calories. Various texts on food technology list their composition. The average fat content of nut meats most frequently encountered for packaging is given as follows:

Nut	Fat %
Almonds	54.5
Brazil	66.4
Cashews, roasted	47.2
Filberts (Hazel Nut)	63.1
Peanuts	44.2
Pecans	71.8
Pistachio	53.2
Walnuts, English	64.4

The fat content is often overlooked as the reason why oxygen transmission rate of the packaging material is of the utmost importance. The packer frequently doesn't know what it is or what is required to reduce the rate of permeability except that he perhaps has used some materials that are better than others for keeping qualities. So he relies on the converter for recommendations and gives the converter specifications dealing primarily with bag sizes, printing, shelf life desired, and cost limitation.

Also frequently overlooked by the packer is the fact that the smaller units require more protection than the larger ones. This comes about because the unit area per unit weight (or volume) increases with decreasing size. Fig. 4 shows this relationship in which the example is a product bulking 60 cu. in. per lb. with the assumed package dimensions as indicated for 1-lb., ½-lb., and ¼-lb. units. In this case the unit area per ounce of weight is 2.1 times greater in the smallest than in the largest package.

Effect Of Oxygen And Moisture On Nut Meats

Peanuts. Moisture is of particular importance in peanuts and peanut products, and if it is much above normal, the moisture can cause more deterioration than mere oxidative rancidity. Salted peanuts held at a temperature of 75 deg. F. and 50% R.H. have shown a shelf life of eight

weeks but this has reduced to four weeks if the R.H. has been allowed to increase to 65%. This indicates a 50% decrease in shelf life by a 15% increase in R.H.

Salted peanuts should contain not more than 2% moisture — preferably even less — to be of best quality. If the moisture content exceeds this figure it results in loss of luster and soggy texture.

Pecans. The effect of oxygen is the development of rancidity which is destructive of the flavor of the pecan and the cause of a progressively darker color change. Normal moisture content is considered to be 3.5%. If moisture content exceeds this figure it leads to poorer texture and susceptibility to blue mold. Below normal, flavor characteristics are also affected. If much loss occurs, the pecans become brittle.

Air, Vacuum, Or Gas-Packed Product

Organoleptic examination of nut meats has determined that the maximum permissible amount of oxygen in the gas surrounding the nuts is in the range of 2% to 3%. Obviously, the presence of any air initially inside the package will affect the shelf life adversely even if the packaging material has zero permeability.

This is even true of the commercial vacuum pack of nuts and coffee in rigid containers, for there is still a small amount of oxygen remaining in the package because a complete vacuum is not effected. Vacuum packaging of nut meats is not considered to be desirable in flexible containers from the viewpoint of product appearance and the breakage of the more tender meats such as pecans and walnuts.

In controlled atmosphere packaging, the operation first evacuates the package which is then "broken back" with an inert gas, meaning the vacuum is relieved by an inert gas, and the package is then heat sealed while it is still under the pressure of the inert gas. Pressure of the gas can be regulated so as to give a slight cling (slight vacuum in the flexible container) or to the point of no cling (slight pressure in the package).

Of the two inert gases used in gas packaging, nitrogen is to be recommended over carbon dioxide for nut meats. Transmission rate of carbon dioxide through flexible films is, on the average, about four times greater than oxygen, but nut meats and, in particular, their oil, absorb carbon dioxide. This will set up a difference in partial pressure that will eventually cause a vacuum to form inside the package. Nitrogen packing is much more desirable, and all the benefits of a vacuum pack can be obtained without its disadvantages provided the film has low oxygen permeability.

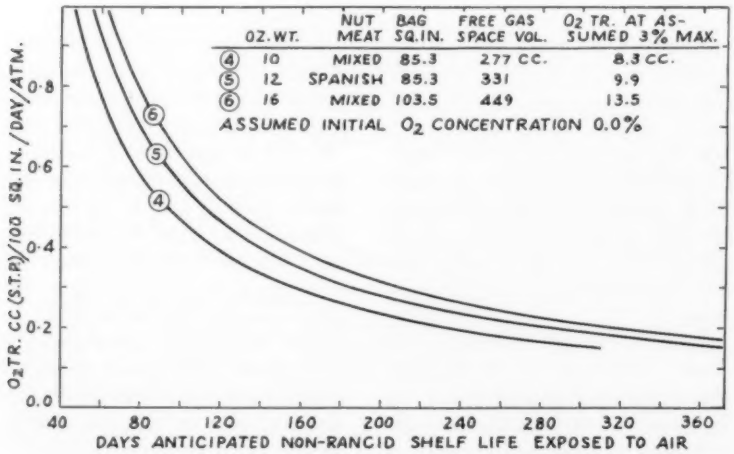


Fig. 6. *Calculated maximum oxygen transmission permissible for a specified shelf life (large package).* Larger packages present slightly less exacting barrier problems. From the flattening of the curves at the end pertaining to long shelf life, it can be seen that a very small amount of oxygen transmission beyond the maximum can greatly curtail the shelf life.

Determining The Oxygen Transmission Rate To Give A Desired Shelf Life

Data can be assembled from which it is possible to predict what shelf life can be expected of a nitrogen pack from a given oxygen transmission rate, or the maximum oxygen transmission rate to give a required shelf life. This is done by determining the free gas-space volume of the package and, on the basis of 3% maximum oxygen, finding the equivalent volume of oxygen that may be permitted to permeate into the package.

This value, and the measured surface area of the pouch, are substituted in the formula for permeability and then solved for T (the time). Since transmission rates are usually stated "per atmosphere", corrections can be made for exposure to ordinary air, oxygen being 1/5 of the atmosphere.

Examples of such calculations are shown in Fig. 5 for 2½, 3, and 6-oz. units; and in Fig. 6 for 10, 12, and 16-oz. units. Not indicated in Fig. 5 because of the size of the graph is the effect of other than zero initial oxygen at time of packaging. Each fraction of a per cent initial oxygen, of course, reduces shelf life.

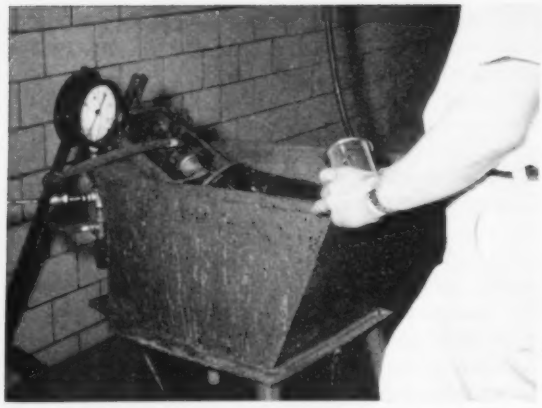
For example, in the oxygen transmission range of 0.20 to 0.40 cc./100 sq.in./day/atm., the effect of as little as 0.3% initial oxygen in the package is to shorten the time on the average of 14 days for the smaller packages. For the larger units, as in Fig. 6, the reduction is an average of 20 days.

It is advisable to make periodic checks of packages off a production line for per cent initial oxygen content. Wrinkles in closure seal of bags should be avoided as each wrinkle is a possible point for admitting air.

Summary

In the packaging of many products in flexible packages a great deal of quantitative information about the

(Continued on Page 56)



1. While a can is held in this device which keeps it under water during the time of test, the machine delivers air pressure into the can. It is easy for the attendant to spot air escaping at any point. Bubbles reveal the extent and location of leaks.

2. In cutting a sample from a can, he is very careful to do it properly, using a special type of can opener developed for this purpose. The advantage of this type of opener is that it permits the cutting of the end without distorting the can construction.

Practical inspection of empty and filled metal cans

By combining the talent of its quality control, production control, and production departments, M & R Dietetic Laboratories Inc., Columbus, Ohio, food products manufacturers, now carries on the continuous inspection of both empty and filled, and closed and seamed metal cans. As do other large users of metal cans, M & R receives these in carload lots. Similarly, it applies the generally accepted techniques of statistical quality control and container sampling. However, a particular point of interest is the practical application of inspection techniques in the production area.

Because a substantial share of the metal cans involved in this testing program are used for a sterilized milk product, the plant research and operating group has given special care to development of a thorough testing program. Even so, the tests and evaluations are equally applicable to cans used for other products. It is simply that the paramount necessity of maintaining high standards for the packaging of a baby food gives special emphasis to this program.

At the same time the company has been able to develop its standards without raising inspection costs to an excessive level or placing an unusual burden on its metal can suppliers. In fact, these tests have been developed with the general approval and cooperation of the can manufacturers, and incorporate a number of ideas representative of the best available contemporary inspectional practices.

Even though M & R has refined its practical application of quality control to this extent, its management acknowledges that its practices are always open to review. It is company policy to foster the closest possible teamwork of the various departments of the plant as well as that of the company and its suppliers so that its examination procedures utilize the latest concepts of sound inspection consistent with production realities. The entire program is never allowed to be cumbersome.

Perhaps the keystone of M & R's inspection program is its inherent simplicity coupled with its close association with the production scene.

3. To make the close examination of can seam, he cuts out a section with this power saw. As he holds the can on the stationary guide, a small section is cut cleanly away to facilitate its removal for examination purposes. Using this technique avoids distortion.

4. Although good tools and a strong arm are necessary, one preparing cans for inspection must use care to avoid bending or distorting the various structural points. Although being done here with empty cans, the same procedures apply to cans seamed in the M & R plant.

Even with the increasingly large usage of statistical quality control and container sampling, some *companies have not yet crystallized their techniques of evaluating the samples thus obtained. The M & R Dietetic Laboratories, Inc., in cooperation with leading container suppliers and food processing companies have obtained and developed sharply defined methods of effective container testing. Similar techniques are also applied to its testing of filled containers, which are closed and seamed in its own plant. Its can laboratory is a working combination of inspection on a continuous basis, and at the same time, one that avoids becoming complicated or cumbersome.*

Upon the arrival of a carload of cans, a typical representative sample is taken from the car in accord with generally recognized sampling techniques. For example, where a car contains 140,000 cans in bundles of 280 cans each, the quality control people obtain 120 representative cans taken from throughout the car.

Testing Under Water

The first test is to put each can into a machine which develops air pressure at a specified psi into the can while it is submerged in water. The operator places a can against a rubber disc and secures it tightly prior to immersing it into the water by means of a foot pedal action. While the can is under water and the air is being forced into it, it is easy for the attendant to spot air escaping at any point. Bubbles reveal the extent and location of leaks.

One of the main objects of this test is to watch for any pinholing of the tinplate. Likewise, manufacturing defects could occur at a number of other places, such as along the seam.

Lest this close scrutiny of cans implies that large numbers of them are defective, the company emphasizes that relatively few cans fail to pass. However, company executives assert that the care demanded of the product fully justifies routinely conducting these tests, even though a very small percentage of cans is rejected.

Following the water and air test, the sample cans go into the can laboratory where a quality control man subjects each can to detailed visual examination. For example, he examines a can for excessive solder, watching for points around the can where such quantities of solder might interfere with the can closing technique and machinery.

Also he looks for loose solder inside the can. If he can force a piece of solder off, the can is defective. However, if the piece is not too large and is bonded so tightly that he cannot force it free, it is not a defect.

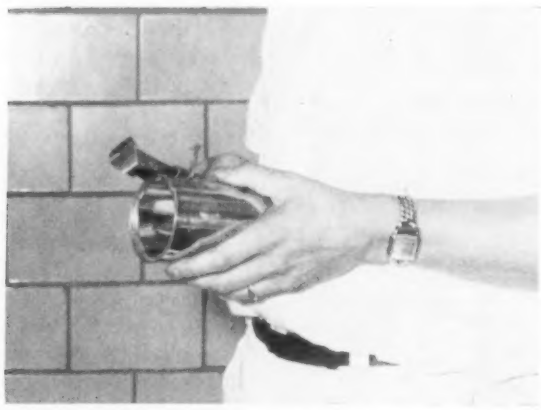
Another test is to check for breakage of solder while flexing a can. In cooperation with can suppliers the laboratory developed a stationary jig or device to hold the can while the attendant flexes it.

Flexing Aids Test

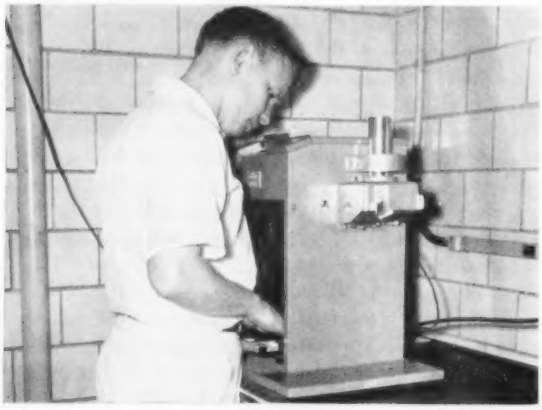
A practical test here is that if the joint at the top flange does not snap during the flexing process, the can passes. Another purpose of the flexing is to let the quality control man check the temper of the tinplate. It requires a certain rigidity and if it is excessively flexible, subsequent damage could occur. Using his broad experience with metal cans, the attendant is able to judge this without recourse to instruments or tools. An excessively flexible can is at once evident during the flexing process.

Similarly, he checks the can inside and out for surplus soldering flux or

5. Holding a can on this stationary jig, the attendant flexes it. If the joint at the top flange does not snap during the flexing process, the can passes. Also it lets him check the temper of the tin plate—to detect excessive flexibility.



6. Before and after the various cutting and peeling processes, close visual examination of a can sample is necessary. For example, he looks for loose solder or solder pieces which he is able to force off—thus indicating that the can is defective.



7. Using a Wilkens and Anderson Model 4-B seam projector, he checks or measures the percentage of butting and overlap. At the same time he can check for deformities in the seam. With this instrument, the image of the seam is projected on a test card, which is marked to measure or check the different elements of this test.

for scales, grease, or any other contaminant. He watches for any peeling or flaking of the tinplate.

He next checks the manufacturer's end for a cutover — a point or location where the can is seamed too tightly at the manufacturer's plant. Following this, he cuts out the end using a cross section sawcut at the bottom of the seam in order to take a specimen for checking on a seam projector. Care is taken in making this cut to avoid distortion. Similar care is necessary in obtaining a specimen of the bottom itself for close visual examination. In other words, they take just as much care getting a sample of the seam and bottom as they do in sawing out a cross section so that they have representative seam samples to check.

Using A Seam Projector

The laboratory has a Wilkens & Anderson Model 4B seam projector. With this equipment, the image of the seam is projected onto a test card. This card is marked to measure the percentage of butting and overlap. At the same time, it shows other deformities in the seam. M & R has developed its own standards of inspection and determines on a percentage basis the evaluation of the seam. The test is set so that a can seam either passes or does not.

The reason for this test is to be sure that the overlap is sufficient. If the overlap is not sufficient, the can might leak during the sterilizing operation. In evaluating cans it is important to consider the extreme pressures to which these cans are subjected during the sterilizing process.

Next a laboratory man cuts a cover loose from the can body. This leaves a portion of the cover lapped into the body and he then removes this portion. He now evaluates the double seaming tightness in accordance with visual inspection standards and measures the cover juncture. In measuring the cover hook juncture, he also watches for extra metal that could result in damage due to the variation — because of the way the seaming equipment is adjusted to operate.

For more information circle No. 218 on Card →

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Examine Critical Points

The cover hook juncture at the top of the body is a critical point. There is more likely to be a cutover here than anywhere else in the can because the presence of a cutover means that the machine has crimped it so tightly that it has cut through.

The quality control man next places the can on a seam spreader in order to spread the side seam and check it for lack of solder. The spreader serves to hold the can while the attendant breaks the seam on the side of the can in order to visually examine the quality of the soldering.

Occasionally they take micrometer readings (measuring in three places and recording the two extremes) and check the thickness of the metal. Also, they measure the actual length of hook where the seam hooks under the body. And while making all of these tests they check for such things as pinholes, defective assembly, poor soldering or seaming, as well as the grade and temper of tinplate.

Following completion of these tests, the quality man enters his results on the record form.

Check On Filled, Seamed Cans

While the foregoing tests apply to empty cans delivered by the manufacturer and are done by a quality control representative, a man from the production department carries on similar tests using the same equipment with filled and seamed cans. In other words, the practice at M & R is to check the company's own seaming as well as that of the can manufacturer.

In this way immediate action can be taken if something occurs requiring removal or tracing of cans. Production of the line is coded so that tracing may be done readily. Further, the quality control man double checks the reports secured by the production representative. In this way the plant checks its own seaming just as closely as it does that of the can supplier.

This emphasizes the importance of having the can laboratory physically as close to production as possible. At the M & R plant this is located within a few feet of the principal seaming equipment of the production line area. The can laboratory is part of the company quality control operation and is a branch of its main laboratory. Although known as the "can lab", it is also used for product, ingredient, and material testing.

The reporting of results is part of the acceptance program. Based on these reports the company will accept or question a carload of cans. For example, the principal reporting form is geared to recording by a percentage basis using a question zone which runs at an upward angle along the paper on which the findings are reported.

Simplified, Graphic Reports

As the quality man checks his empty can samples, his line of entry on the report form is straight if there are no defects. But if the defects climb at a rate greater than the outline of the question zone, the report indicates that the can goes into the reject classification, based on the results obtained. The can is then questioned and the can manufactur's representative is called in.

However, if the reports continue to log in the question zone, the quality man keeps on checking until he gets out of that zone, either by moving down into the accept section or up (on the form) into the reject section. If he is still in the question zone at the finish of his sample reporting, the can manufacturer is notified.

As noted above, the number of unacceptable cans is comparatively small and the tests carried out are done in accord with the can manufacturer's recommendations. When the company questions a carload of cans, the manufacturer's representative comes to the plant and carries on similar tests. In this way any final acceptance or rejection of the carload is predicated on mutually acceptable testing procedures.

Close Follow-Up

Another phase of the entire program is its supervision by the plant production control organization. This unit maintains liaison with other departments of the company, studies the reports of the quality control men, also checks on the production quality reports, and the quality control rechecks of these reports. This is inherently a follow-up operation and ties in with the general practice of the plant to provide for adequate tracing and follow-up of both product and packaging.

M & R executives assert that their quality control and container inspection program cannot operate in a vacuum. It ties in closely and interdependently with production and production control. This teamwork approach assures the development of effective, realistic standards that provide the requisite measure of protection without becoming unreasonable or costly to M & R or its suppliers.

Remember — it works both ways

When considering container quality control, a company often tends to think in terms of the suppliers' manufactured quality. The practice of M & R emphasizes the vital importance of checking the user quality control also. M & R checks its own seaming et al just as rigorously as it does that of its suppliers.

Thomas M. Glynn has been associated with John H. Breck, Inc., for 14 years. He has a B.S. degree in Business Administration from American International College. He is a member of Packaging Institute, American Management Association, and Institute of Management Sciences.

Many a plant is hard pressed to meet sudden and unpredictable demands for short runs—often involving quite a bit of hand work. John H. Breck, Inc., finds that its local workshop for the blind is an effective sub-contracting point for the expeditious completion for such work. In this article, Mr. Glynn outlines the system used, sets forth its advantages, and emphasizes the humanitarian aspects of the program.

Blind people prove useful in packaging assembly work

By Thomas M. Glynn,
Production Manager,
John H. Breck, Inc.,
Springfield, Massachusetts

Very often a packaging plant is faced with a problem of subassembling component parts of a package or to produce a short run of an item that involves considerable hand work. Occasionally, in order to meet target dates set by the sales department, hand assembly work must be resorted to in order to have interim production to allow the operation to become mechanized.

One solution to this type of problem is offered by sub-contracting this work to a state or privately-operated work center for the blind. We have used such supplementary assembly on a few of our items and have been extremely satisfied with the results.

A typical item would be a styrene case which has to be lined with gold foil and loaded with 50 bobby pins and one dozen hair curlers. This component is then packed in a deal which is to be offered as a Christmas item in relatively limited quantities.

The procedure which we follow is to call the manager of the workshop and show him the operation in detail, the quality expected, the volume and delivery schedule. A rate per hundred is agreed upon. As deliveries are made, they are invoiced and the entire procedure is handled on the same basis as any other type of supplier.

Advantages Of System

We have found the following advantages to exist using the above mentioned procedure

1. No temporary increase in plant work-force.
2. A fixed cost per hundred units.
3. Fewer restrictions on design of material which otherwise might be limited by the restrictions imposed by mechanical requirements.
4. No diversion of engineering talent to work out mechanical applications for a short run.
5. No equipment purchases.
6. No training costs.
7. No hidden overhead or employee compensation charges.
8. Factory space freed.
9. Extremely low spoilage rate.
10. Excellent degree of quality and accuracy.

They Feel Productive

The circumstances permitting this plan are that usually a state supported agency allows a daily wage to each blind worker; if a part or all of this allotment is matched by income from his production, addi-

1. Sub-contracting such assembly work as this is advantageous because it makes it unnecessary for the plant to increase its own work force. Also, no factory is tied up for it and the difficulties involving any mechanization of the project are avoided.

2. An extremely low spoilage rate and an excellent degree of quality and accuracy are among the results of "farming" this sort of work out. Similarly there are no training costs involved and no hidden overhead or employee compensation charges.

3. In planning a project such as this, the plant calls in the director of the workshop, shows him the operation in detail, the quality expected, and the volume and delivery schedule. The components go to the workshop and all of the work takes place there.

tional handicapped individuals can be brought into the program.

These persons would otherwise not participate in a productive program due to budgetary restrictions. In the case of our local state-supported workshop, the director is convinced of the efficacy of the feeling of productivity on the individual's mental health. As a result, he is constantly attempting to augment his budget through outside income and thus make the facilities available to more of the less fortunate. He realizes that his charges must be in line and handles all transactions on a business-like basis.

Information concerning the location of the nearest workshop of the blind may be obtained through:

American Foundation for the Blind
15 W. 16th Street,
New York 11, N. Y.

4. By letting these blind people do this self-assembly work, not only does the factory gain all the advantages from not having to do the job itself, but these workers gain both additional income and the feeling of productivity, which is extremely beneficial to their mental health.

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Solves tough sales-wrap puzzles as it cuts your costs! Packagers agree Waxed Glassine emphasizes product quality, assures maximum consumer convenience, stimulates more sales by brand!

THE POWER OF WAXED GLASSINE OUTER WRAPS:

More eye appeal—Sparkling surface provides perfect background for brilliant, appetizing illustrations, lets you use entire package for powerful all-over sales-winning designs that prompt purchase!

Billboards your brand—Every package is a *billboard* generating impulse sales and assuring repeat customers with its fresh, inviting look, strong appetite appeal and stand-out brand identification!

INNER AND OUTER WRAPS OF WAXED GLASSINE:

Extra flavor protection—Safely seals in all that desirable just-made goodness, keeps customers coming back for more.

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Extra grease protection—Waxed Glassine wrappers resist penetration by fats, oils, shortenings. No more rancidity problems! Package stays clean, inviting, colorful!

Extra strength—Waxed Glassine passes rugged test of delivery. in-store and consumer handling! Made stronger to stack better, it cuts down crumbling, breakage, ripped wrappers and returns!

Low cost—Lower basic costs plus constant, dependable supply combine to produce an economical package that reaches out and sells!

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Robert F. House has been associated with the Appleton Electric Company for 22 years. His first job was working on the floor in the raw casting department. He later moved into the work of special items, then into order writing for the special divisions. Soon he got into inventory control and follow-up work, and later into sales analysis. For the past five years he has been the company's packaging engineer. He is a graduate of the National Metal Trades School and has attended Northwestern University's school of commerce. He is a member of the Society of Industrial Packaging and Materials Handling Engineers.

By combining specially developed machinery and in-plant operational techniques with a novel system of centralized inventory control, Appleton Electric Company now gets peak efficiency in its label and packaging material usage. This article tells how the company overcame its difficulties entailed in packaging and labeling 20,000 different electrical items. It also emphasizes the importance of close centralized control of all components—even to roll stock used for label production.

Simplifying and controlling package label usage

By Robert F. House,
Packaging Engineer,
Appleton Electric Company,
Chicago

Since we produce and package some 20,000 different electrical items, our labeling difficulties often are quite extreme. They are aggravated by the fact that many parts and items are of low volume, so that inventorying any supplies of labels becomes cumbersome. For some of our products a supply of 1,000 labels (probably the minimum quantity to produce economically) represents a five to ten year supply.

Our current attack on the labeling front is making progress in two ways: First, we have mechanized our label printing operation so that we can print varying quantities directly from roll stock. Secondly, we have labels and label stock paper (along with other packaging materials) under the same centralized inventory control that governs our product manufacturing operation.

Originally we considered the hand stamping of plain labels as an alternative to printed labels. That proved unsatisfactory because we could not get the uniformity of stamping we considered essential. Also, our management wanted our labels to carry the two colors that identify our company's products. Further, we found that some of our girls were stamping labels without the correct ink and with worn type. In addition, we were getting a lot of variations, both as to stamping and label placement.

Wanted: Machine Printing

In looking for a machine to do the printing of labels as needed in order to give us a flexible supply, we also sought a means of printing these labels in two colors, that is, our standard red and blue. After some discussion we induced the Weber Addressing Machine Company, Inc., to manufacture such a unit. Our cooperative participation with them led us to our present equipment.

As a result, we now have a label printing unit that can be set by dial for any quantity from one to 2,000 labels. It does not require the operator's attendance. He merely starts the machine and it prints, cuts, and stacks the labels automatically. Our latest modification of this equipment is the use of jumbo rolls capable of producing 30,000 labels instead of the smaller rolls which yield only 2,500. Use of demountable rubber type provides quick change-over from one label specification to another. We have adjustments for the depth of cut as well as for placement of label copy.

In-Plant Application

On our packaging floor we have two Jagenberg machines which apply labels to the flat blanks of our metal edge boxes — into which most of our smaller products go. These machines are adjustable for box size and label position. In connection with them we use specially built wood and metal racks of our own development to hold box blanks. Predrilled holes permit easy and rapid changing of guide members.

Our plant also worked out an adjustable table for blanks so that the supply is kept even, i.e., in horizontal alignment with the Jagenberg equipment. The operator merely actuates a foot pedal to make the table rise to keep the box supply even.

Once labeled, these blanks go to the forming equipment used for our metal edge boxes. From there completed boxes go into box pens which hold supplies of these boxes for transfer to the points of actual packaging along our lines. In the course of the next operation boxes are filled, closed, and stored pending shipment from the plant.

Use Printed Labels

We still use pre-printed labels for our large volume, high production items. However, through standardization as well as through the use of the new printing equipment for label production, we have reduced our number of sizes of label blanks from 35 to ten. Even so, we occasionally use the in-plant printed labels for some large volume items.

It sometimes happens that there is an over-run of production of some product or item. As a result, our supplies of printed labels may suddenly be inadequate. To meet this emergency need we simply run off the requisite number of labels on our printing equipment. One of its advantages is that we can use it for fast set-up to meet short notice demands for labels.

Close Inventory Control

The second major phase of our labeling improvement program is the maintenance of strict control over label usage and supplies in accord

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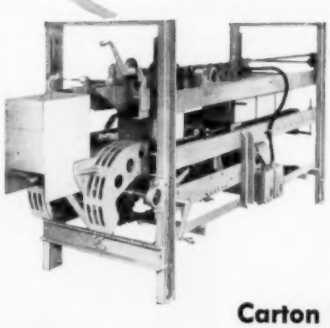

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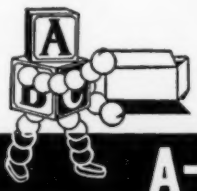

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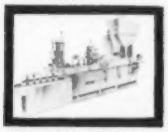

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with our centralized inventory control system. All other packaging materials are under similar control as well as the rolls of plain paper stock used for label printing.

In other words, our packaging materials and components are under the same strict control as all of the items we manufacture. This centralized system represents a project conceived and executed by Arthur I. Appleton, president of our company. Omitting for the purpose of this discussion the purely product manufacturing and control aspects of this system, and looking at it from the viewpoint of packaging material control, the essence of it is that it provides a distinct visual control of all items.

A unique feature of Mr. Appleton's system is his device developed to signal the five basic control points of an inventory control system. These include (1) the order point; (2)

1. Running automatically, this machine prints labels in any quantity up to 2,000. The operator merely starts the unit, after which it prints, cuts, and stacks labels automatically. It uses demountable rubber type for quick change-over from one label specification to another.

2. Use of jumbo rolls instead of the smaller rolls normally associated with this type of machine makes possible the production of 30,000 labels instead of 2,500. This machine prints labels in two colors in accord with Appleton marketing requirements.

the order follow-up point; (3) an out-of-stock condition; (4) safe stock conditions, and (5) an overstock.

Unique Visual Signals

This visual signaling device is used at the bottom of each card, of which there is one for each item and which represents the source of basic data for its control. Along the right hand side of the lower portion of the card are numbers in black from zero through 18 representing weeks, and numbers in blue from five through 24 representing months.

As the indicator or pointer is moved along the line of figures and is stopped by a particular number, it causes the appropriate visual indicator to appear in a small circular window at the bottom of the card. Combinations of colors and graphic symbols denote the five major points.

By this means the condition of

3. This Jagenberg unit applies labels to flat blanks of metal-edged boxes. These machines are adjustable for box size and label placement. After labeling, blanks go to the forming equipment and to box pans for transfer to packaging lines.

4. Specially built wood and metal racks such as this permit folding box blanks and adjusting for different sizes of blanks. Pre-drilled holes permit easy and rapid changing of guide members to meet different requirements. The plant also developed an adjustable table for blanks to facilitate feeding into the Jagenberg equipment.

labeling | faster
shipping | IS cheaper
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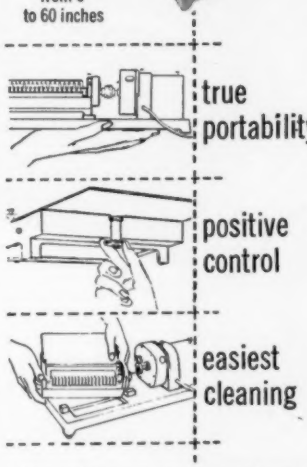

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CONTAINER: Paper is coated with Polyethylene (to stop grease and moisture transmission), for converting into heat-sealed bags for foods, parts, or semi-solid materials.

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PROTECTIVE PACKAGING MATERIALS

supply of a particular item is immediately and graphically presented to whomever is checking the card in the course of various inventory control operations, such as the posting of orders, stocks, etc. As a clerk makes a posting, she merely aligns the indicator with the appropriate week or month mark, as the posting may indicate.

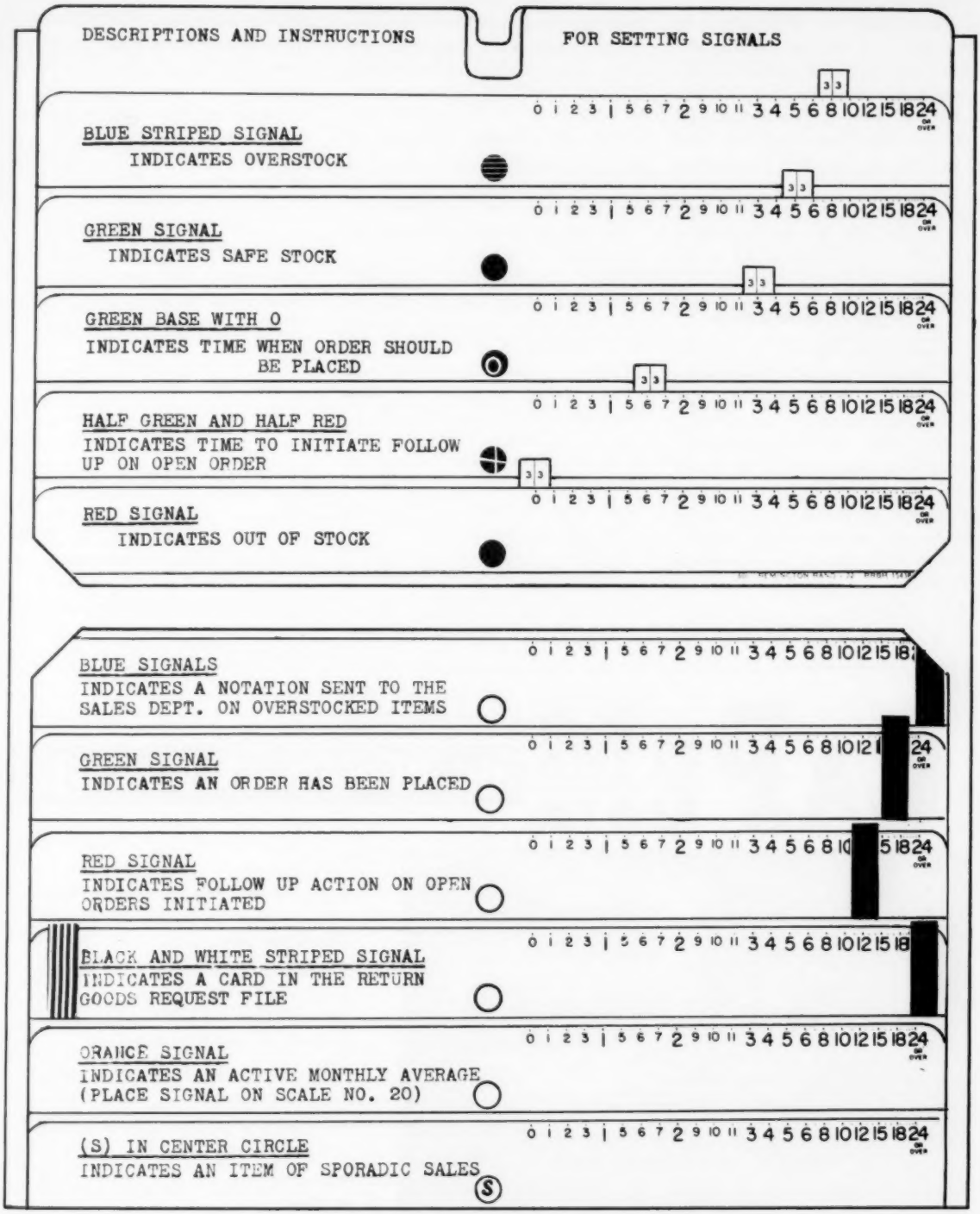
A focal point in the control of packaging materials (including labels) is that all orders are posted prior to issue. As a result, stock is controlled as an office function. This means it is protected from the casual, unrecorded or indiscriminate issue by the various clerks or stock men in the warehouse and shipping sections.

Accurate Basis For Orders

In other words, these people are relieved of having to issue stock or place orders concerning it — on which they might have incomplete information. Since the centralized system gives the office close control of all of these supplies, orders and reorders are made from the office as indicated by our control system. This means that anything requiring an exercise of judgment (such as the ordering of label roll stock) is done by someone who has all of the facts (as detailed on our cards) on which to base such a judgment.

Further, having both product and packaging material inventory control centralized makes possible coordinating the arrival of packaging materials with the items to be packaged at the packaging lines. When an order leaves the sales analysis and inventory control unit, copies of it go to interested departments. IBM cards go to the packaging and label departments.

This means that as soon as the initial stock order goes out, the office issues IBM cards. These are for the material, i.e., the products under fabrication. At the same time it issues IBM cards for the packaging materials. Details are included such as container specification, quantities, and so on. Another IBM card covers the label details, including size and catalog number, and


DESCRIPTIONS AND INSTRUCTIONS
FOR SETTING SIGNALS
BLUE STRIPED SIGNAL
INDICATES OVERSTOCK
GREEN SIGNAL
INDICATES SAFE STOCK
GREEN BASE WITH O
INDICATES TIME WHEN ORDER SHOULD BE PLACED
HALF GREEN AND HALF RED
INDICATES TIME TO INITIATE FOLLOW UP ON OPEN ORDER
RED SIGNAL
INDICATES OUT OF STOCK
0 1 2 3 | 5 6 7 2 9 10 11 3 4 5 6 8 10 12 15 18 24 OR OVER
BLUE SIGNALS
INDICATES A NOTATION SENT TO THE SALES DEPT. ON OVERSTOCKED ITEMS
GREEN SIGNAL
INDICATES AN ORDER HAS BEEN PLACED
RED SIGNAL
INDICATES FOLLOW UP ACTION ON OPEN ORDERS INITIATED
BLACK AND WHITE STRIPED SIGNAL
INDICATES A CARD IN THE RETURN GOODS REQUEST FILE
ORANGE SIGNAL
INDICATES AN ACTIVE MONTHLY AVERAGE (PLACE SIGNAL ON SCALE NO. 20)
(S) IN CENTER CIRCLE
INDICATES AN ITEM OF SPORADIC SALES
S

This combination of visual and color codes and numerical indicators represents the heart of the unique system of centralized inventory control developed by Arthur I. Appleton. As the indicator is moved along the line of figures representing weeks and months, the appropriate visual symbols show up in the circular panel at center. In this way there is an immediate visual indication of the supply condition—ranging from overstock to out of stock, and covering all conditions in between. Colored plastic indicators at far right reveal status of orders.

similar specifications.

Thus, orders for labels go out at the same time that the order for the manufacturing of the part to be packaged and labeled goes out. Another aspect of our centralized control is that the label stores man not only pulls or prints the labels as necessary but also orders the box and container supplies sent to the packaging line. His doing this is merely another extension of our centralized inventory control.

Identifying Letters Help

Similarly, his only basis for making labels is the IBM work order card that tells the quantity and other details of a particular label. Similarly, the card carries identifying or descriptive data regarding the boxes and containers. We have minimized confusion by means of identifying letters and numbers. For example, our inner cartons or boxes carry a B number and the outer containers a C number.

As we acquired other companies in the process of expanding our business, these problems became more complicated. However, we solved the packaging identification difficulty by adding a second letter to indicate B or C numbers concerned with a subsidiary company or division. Thus far this has minimized the confusion in the ordering of packaging materials and labels.

We have experienced a number of advantages in connection with our system. For one thing, some very substantial savings have resulted. We have been able to reduce our physical space allotted to label storage and we have drastically cut down our man hours allotted to the storage and handling of labels. Another advantage of our system is that it lets us meet emergency needs because we can print labels on our own equipment faster than an outside supplier could deliver them to us.

Close Control's Advantages

But perhaps the biggest advantage is that with centralized control everything is accounted for. We avoid the decisions and errors of judgment that would arise without such a control system. By applying Mr. Appleton's unique visual indicator to the control of packaging materials, we know exactly where we stand on the different items and we know just how far they will go.

For example, the inventory control unit knows how many labels can be printed with the different sizes of roll stock we use. They keep track of our supplies of these, just as they do with items that are separate — such as box blanks.

No Confused Instructions

Above all, our centralized control means that the label stores operator receives his instructions from one source only. By following those instructions he will meet the needs of a particular order and have the labels and other packaging components at the packaging line at the same time the parts or items to be packaged arrive there.

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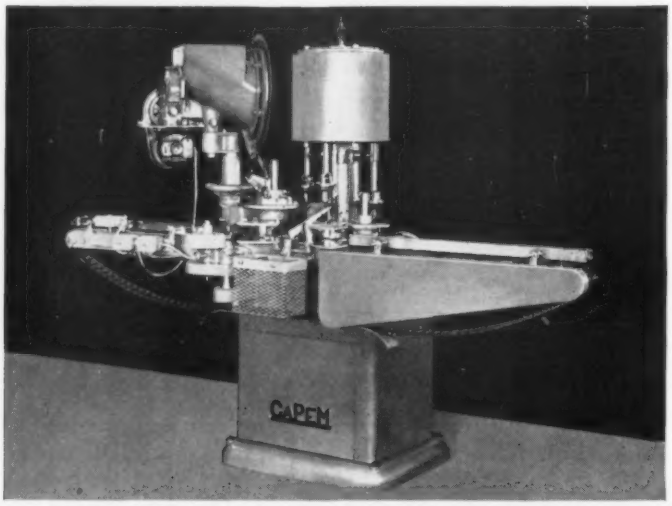

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Halden L. Lewis, currently a packaging consultant, was previously engaged in the organization, development and operation of the staff packaging engineering department of Corning Glass Works. Before joining Corning Glass he held executive positions in mechanical production liaison, plant layout and quality control engineering. He attended Lowell Institute, M. I. T. and Wentworth Institute. He is a member of Packaging Institute and SIPMHE and is an associate member of Sigma Xi and New York State Society of Professional Engineers. He is a visiting lecturer of Purdue University's Institute for Packaging Personnel.

Few units of measure of interest to those concerned with the forces and vulnerabilities involved in protective packaging are as widely used as the "G" factor. At the same time, discussions wherever packaging specialists gather indicate that there is some confusion and misunderstanding about this factor. In this article Mr. Lewis cuts through the haze often surrounding this factor and makes an unusually clear explanation of it. His article deserves the attention of anyone concerned with the mechanics and workings of packaging.

The elusive "G" factor

By Halden L. Lewis,
Packaging Consultant,
Elmira, New York

Actions, reactions, stresses, strains, accelerations, decelerations, forces, weights, and all other physical manifestations are the same in packaging as they are in any other field of endeavor. There are no special considerations that set packaging apart with rules that apply to packaging alone.

The forces that accelerate a package are the same in magnitude as those that accelerate any body of equal weight. The application of forces that result in the failure of a package or a packaged product are the same as those that would cause the failure of any equivalent structure.

With this basic thought, let us proceed with the application of some long established engineering principles to the field of packaging. It is unfortunate that a great many packaging people have had the responsibility of packaging thrust upon them without the formality of being made aware of the need for the application of sound engineering principles to packaging problems. This article is an effort to bring some of the fundamental engineering principles required for the adequate solution of packaging problems to a point where they can be better understood and applied.

Newton's Laws Of Motion

Although Newton's laws of motion have been stated many times, they are the basic laws of the universe and apply to all packages as well as to all other bodies — yours, mine, a golf ball, baseball, football, automobile, train, air liner, ocean liner, the earth, stars, etc., ad infinitum.

Newton's first law: Every body *continues* in a state of rest or of uniform motion in a straight line until it is acted upon by an outside force.

Newton's second law: If a body is acted upon by *several forces*, it is acted upon by each as if the others did not exist.

Newton's third law: To every action there is *always* an equal and opposite reaction.

Unfortunately there is no way to separate mathematics from the application of Newton's laws to package engineering. The mathematics used herein will be kept to a minimum and will be the simplest possible consistent with the explanation involved.

One formula based on Newton's laws, from which the "G" factor may be derived, is $F = WA/G$.

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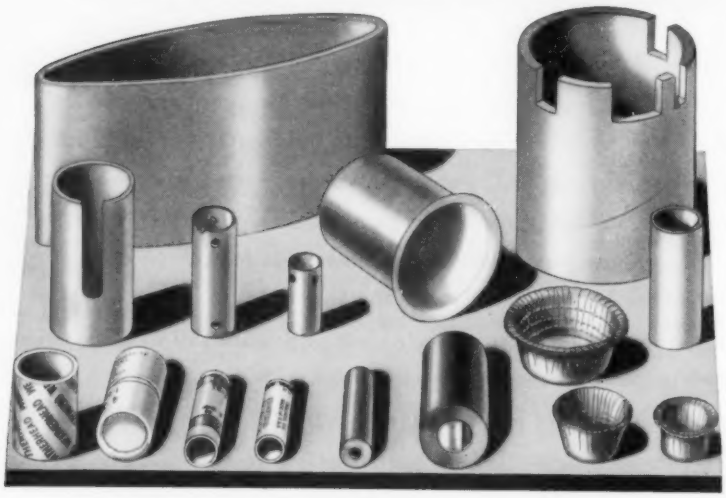

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This means that force F is required to move weight W with acceleration A, in accordance with Newton's first law. It also means — and note this carefully—that if weight W is moved with acceleration A, it will resist being moved with force F, in accordance with Newton's third law. The G is the constant acceleration due to gravity which is the basis for the "G" factor.

"G" Factor Determination

The "G" factor is the ratio of acceleration A, which may be different in each application, to acceleration G, the constant acceleration due to gravity. It is necessary when acceleration forces are discussed in broad terms without specific reference to a particular application. force or combination of forces.

In this formula the force F and the weight W are both in pounds. If a package weighs 35 pounds, the force it applies when placed on the floor of a warehouse, truck, freight car, or another package, is 35 pounds.

Accelerations A and G are both measured in feet/second^2, however, they are different accelerations. Acceleration A is due to force F acting on weight W. Acceleration G is due to the force of gravity acting on any and all bodies everywhere and has an average constant value of 32.16 feet/second^2 anywhere on the surface of the earth. This is the "G" factor reference value.

Accelerations can be either positive or negative. If they are positive, the body is being speeded up, and if they are negative, it is being slowed down. It is extremely important to note that the same force is required to accelerate or decelerate the same weight at the same rate.

Newton's Laws Applied

With the exception of being crushed with a dead load, such as might be encountered in a warehouse, most all package damage occurs in the process of being moved or handled. However, we are not considering material handling equipment herein and it should be understood that any reference to such equipment in the following is only for the purpose of illustration.

As a rough but intimate application of Newton's laws, go into your plant and get an empty hand truck. On a level stretch of floor, push the hand truck from a standstill to your normal walking speed. Note the amount of "push" you have to use on the empty truck. Now do the same thing with the truck loaded with packages weighing 50, 100, 150 and 200#.

Note the increase in the force necessary to get the truck in motion as the load is increased or that if you use less force it will take you longer to accelerate the load to your normal pace. Note also the force required to stop the various loads and that the stopping force is the same as the starting force under the same conditions. Actual measurement of these forces would show a slightly

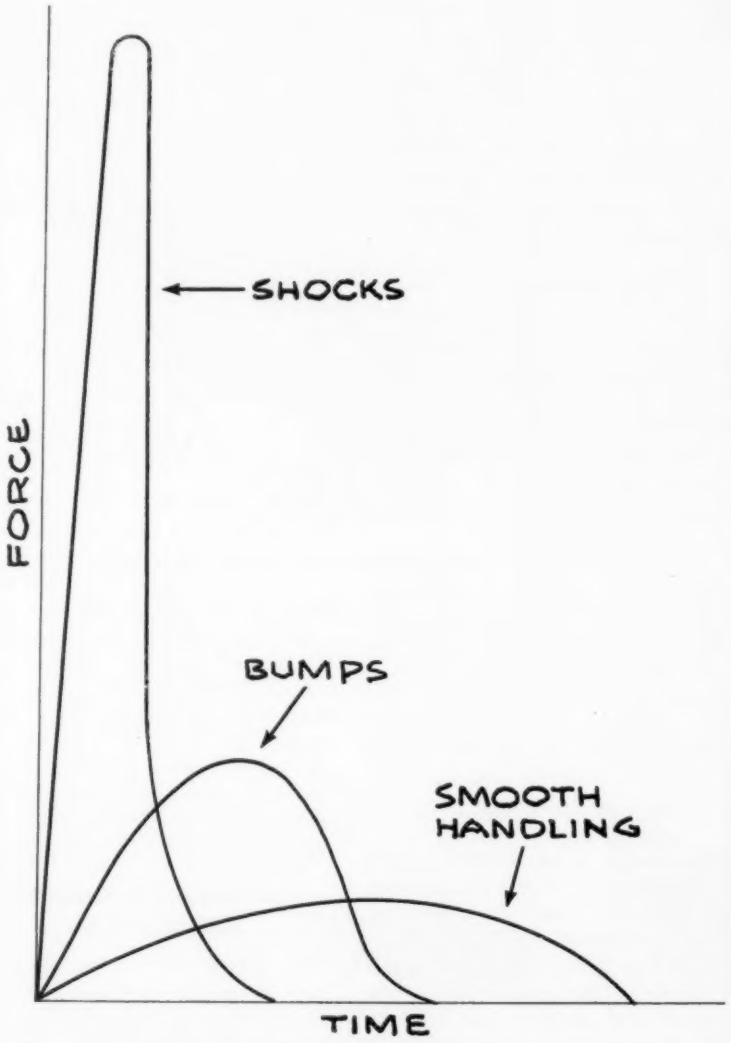

Fig. 1. Here are force and time coordinates and three rough arbitrary traces of shock magnitudes. The descriptive terminology applied to these traces is necessarily indefinite because the definition of what constitutes a shock must be related to the package under consideration. What is classed as "smooth handling" for one item might be a serious shock to another. As used here, "smooth handling" is the force probably encountered in stopping and starting in a shipment with a common carrier. The trace labeled "bumps" probably represents a mild shock encountered in relatively gentle handling. The trace labeled "shocks" represents force that may be responsible for serious package damage.

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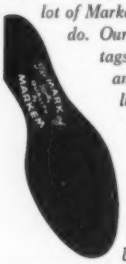
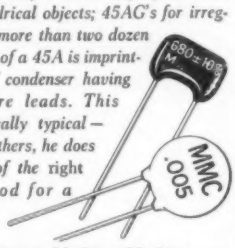
MARKED IMPROVEMENTS in

IDENTIFICATION AND DECORATION

Markem's original foothold *... in business was really just that: making marking machines for the shoe industry. Since then (1911), the shoe field, and nearly every other industry, has been using the Markem Method more and more. Where Markem was "in at the beginning", you'd expect to see a lot of Markem in the shoe business, and you do. Our 32A's imprint payroll coupon tags; jobs for the 1000, 24 or 79AB, and 105-10 or 45AC include quarter lining, match marking, heel pad and sock lining embossing. Currently, a brand new match marking machine is being field tested, along with some special marking compounds for "hairy" hide. Our "special" field, that began at the foot of the ladder, now reaches from one end of industry to the other.*



Nothing succeeds like *... successful use of Markem machines, it seems, especially with one of our electronics customers. Since 1952, they've bought 42 Markem machines of five different types: 20A's for cylindrical objects; a 25A for marking boxes, tape, etc.; half a dozen high production PLBR's for cylindrical objects; 45AG's for irregular shapes; and more than two dozen 45A's. Latest use of a 45A is imprinting a new type of condenser having right angle wire leads. This customer isn't really typical — but, like all our others, he does know the value of the right marking method for a given job.*



13 — 9 — 12 — Markem! *Markem Machines are used throughout "industry", but the things "industry" marks often end up in the corner store, gas station and gift counter. For example, you may not associate "industry" with "sporting goods", but several sporting goods manufacturers use the Markem Method. For example, one company had been sewing two separate fabric labels on football players' hip and kidney pads (we sent in a substitute illustration you'd recognize). Now, trade-name, size, etc. is imprinted directly on the outside of the curved fibre pads, with a 45A, effectively blocking label inventory problems and sewing costs. Maybe your "industry" has some unsolved marking problems. If so, we'd like to tackle them.*

A letter, call or TWX could bring the marking help you need — or can use. The address is Markem Machine Co., Keene 35, New Hampshire.

MARKEM

Circle No. 228 on Card

greater force required to start a load than to stop one, due to friction which may be reduced but never eliminated.

This is a concrete demonstration of the formula, F = WA/G, and of all three of Newton's laws. F (the push or pull on the truck) = (the weight of the truck and the load) multiplied by A (the rate of acceleration or deceleration of the truck and the load) divided by G (the gravitational constant).

Newton's first and third laws are illustrated by the application of the formula which shows the force of both action and reaction. The second law is illustrated by the fact that the force of gravity was acting all the time whether the truck was moving or standing, yet the weight of the load was not affected in any manner by the acceleration or deceleration forces applied.

Finding, Isolating "G" Factor

Now that we have examined Newton's laws of motion and made a rough practical check of their validity, let us now find and isolate the "G" factor. Referring to the formula, F = WA/G, note that it contains A, the acceleration of the weight W due to force F, and G, the constant acceleration due to gravity.

If we write this formula in this manner, F = W(A/G), it still means the same thing, for we haven't altered the mathematical principles involved. We have, however, isolated the "G" factor, A/G, within the brackets and we see that it is part of Newton's laws of motion. The formula can now be written, F = W"G", and it will be correct.

Note that the division indicated by A/G results in an abstract number having no units of its own. It is the ratio of the conditional acceleration A, to the constant gravitational acceleration G. Mathematically this is the "G" factor. In a specific case if the value of A was five times as great as G, we would say we had a five "G" acceleration.

As a further example, let us take a light package delivery truck weighing 3,000# and load it with a total of 500# including the driver. We will now accelerate the loaded truck to 30 m.p.h. in a distance of 250 feet on a level road and find the number of G's or the "G" factor involved. To find the acceleration A we will use the formula $V^2 = 2AS$, where V is the final velocity of the truck in feet/second, A is the acceleration we are looking for, and S is the distance covered by the truck while it is being accelerated.

Application Of Formula

Rearranging this formula we get $A = V^2/2S$. Substituting the known values we get $A = 44^2/2 \times 250 = 3.87$ feet/second^2. Entering this value in our "G" factor formula, we get "G" = A/G = 3.87/32.16 = 0.12 G's. We would call this a 0.12 G acceleration and if the truck were to stop from the same speed in the same distance, the deceleration would also be 0.12 G's.

Applying the force formula, F = W"G" = 3,500 x 0.12, we get a force of 420# required to accelerate the loaded truck. If the driver weighed 150#, the force on him would be 18#. If one of the packages weighed 25#, the force on it would be 3#. The force on the entire 500# load would be 60#.

While the forces in this example may appear small, it should be noted that even in accelerating a high performance modern car from 0 to 60 m.p.h. in 10 seconds, the average acceleration will only be about 0.27 G's. In an airplane the take-off accelerations may be higher but in other forms of transportation they are usually less. From the foregoing, it should be evident that package damage is not caused by normal starting and stopping forces encountered in any form of common transportation.

Package Damage Caused By Handling Shocks

Our first problem in the consideration of handling shocks is to define what a shock is. For our purposes a shock may be defined as a single blow or jar, the effect of which is completely dissipated before the next one is encountered. This is an oversimplification for study purposes because shocks may be repeated with varying magnitudes and follow one

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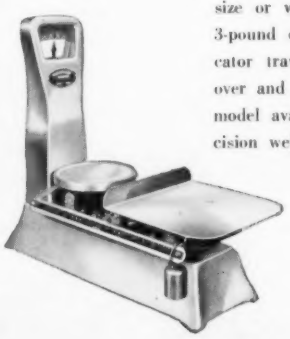

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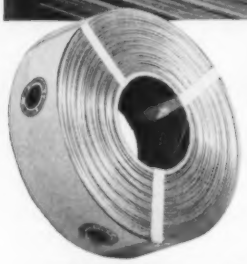

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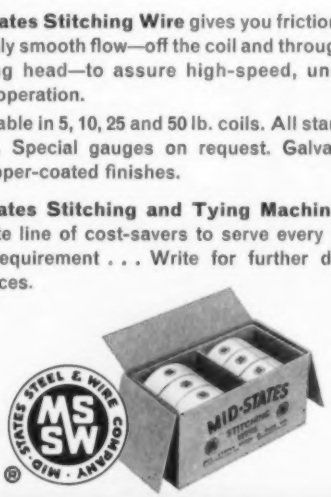

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another so closely they supplement one another.

As an aid to this definition, let us look at Figure 1. In this figure there are shown force and time coordinates and three rough arbitrary traces of shock magnitudes. The descriptive terminology applied to these traces is necessarily indefinite because the definition of what constitutes a shock must be related to the package under consideration. What is classed as "smooth handling" for one item might be a serious shock to another.

A load of coal and a load of eggs cannot be packaged and handled in the same manner. A quantity of liquid in a polyethylene squeeze bottle will be packaged and handled differently than the same liquid in a glass bottle. It is fundamentally important to recognize that it is the item to be packaged that determines what constitutes rough handling.

In the trace labeled "smooth handling" the force represented is probably one encountered in stopping and starting a common carrier. The trace labeled "bumps" probably represents a mild shock encountered in relatively gentle handling. The trace labeled "shocks" represents a force that may be responsible for serious package damage.

The G's Of Package Dropped

Because many packages are damaged by dropping and because dropping can be done under controlled laboratory conditions, we will now consider the theoretical number of G's encountered when a package is dropped. These are theoretical considerations only. Actual accelerations may be either higher or lower in both time and magnitude depending on the conditions under which the test is made.

The theoretical number of G's encountered in the drop of a package is equal to the ratio of the distance of free fall to the stopping distance. If a package falls freely through a distance of 30″ and is cushioned uniformly to a stop in a distance of 3″, the "G" factor will be $30/3 = 10$. If the uniform stop is completed in 0.3″, the "G" factor will be $30/0.3 = 100$. In the first case we have a

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10 G deceleration and in the second case a 100 G deceleration. Comparing these decelerations with those encountered in the stopping and starting of a delivery truck, it is evident why rough handling causes the greater portion of the damage.

It should be noted that the time involved in the forementioned 10 G stop is 1/8 of a second and that involved in the 100 G stop is about 4/100 of a second. The important thing to be gained from the reference to the time is that actual damage is not necessarily dependent on time. When the force becomes large enough to cause failure, the failure will occur at that instant.

Reasons Supporting Theory

There are a number of reasons why the magnitude of force and time involved in the forementioned simple dropping calculations is theoretical. In all of the calculation up to now we have been assuming the decelerations have been uniform. This means that the force involved in the previous 10 G deceleration would have to rise to 10 times the weight of the package instantaneously, remain at that value for exactly 1/8 of a second, and then instantaneously drop to zero.

In actual practice this does not happen. The trace of the actual forces may look somewhat like those shown in Figure 1. This is due to the fact that all things deflect or "give" in varying amounts and in different ways as force is applied. The packaged product will change shape. Cushioning materials do not compress at uniform rates. Containers change their shape as they encounter loads. Floors deflect as packages are dropped on them. Air entrapped in the package may act as a cushion at the time of impact. These variables combine to make it almost impossible to make a simple exact mathematical analysis of the problem of shock in a package.

Because of this natural barrier to an exact analysis, drop tests must be made for comparison purposes only. All factors except the one being investigated must be the same for a reliable test; temperature, humidity,

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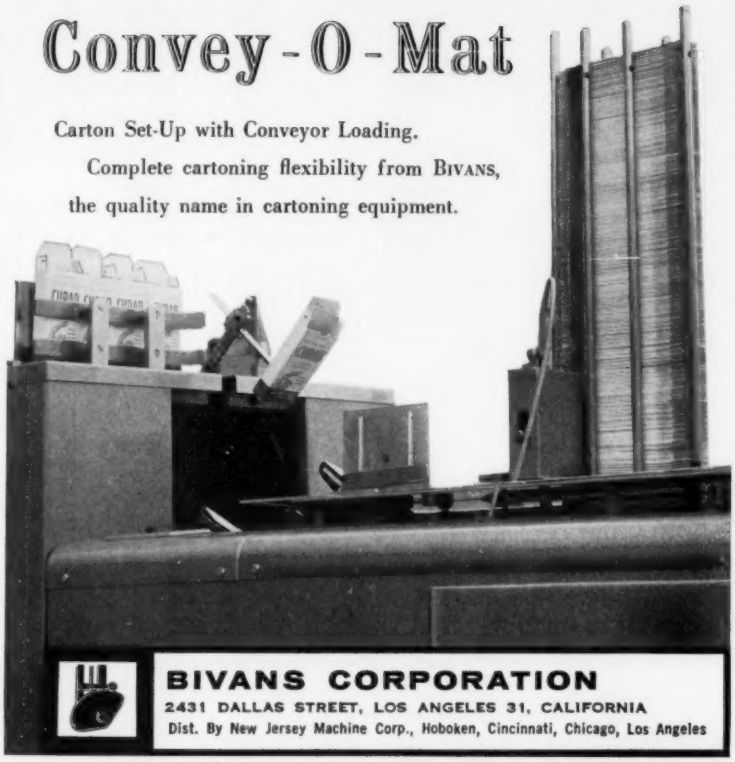

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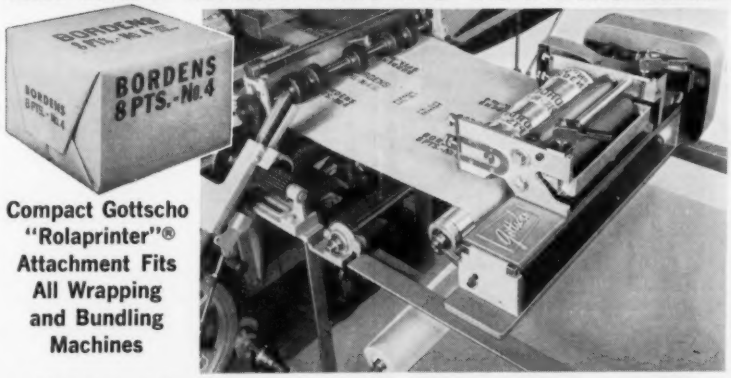

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drop height, drop testing equipment, equipment foundation, packaging materials, and product, to name a few. It would even be well if the same laboratory technician performed both of the comparison tests.

Package Damage Caused By Vibration

While shock was defined as a single isolated blow or jar, vibration consists of many blows or jars following one another in periodic succession. At any given instant either their force or number may be steady, increasing or decreasing.

The mathematics of vibration is a rather complicated subject that has no place in a short article such as this. It involves such things as natural, forced and resonant frequencies; viscous, coulomb, or solid damping, or a combination of these; transient and steady vibrations, and magnification factors. Those interested in further study of this subject might like to procure a copy of the book, *Mechanical Vibrations*, by William Tyrell Thomson.

In the consideration of the forces causing damage during vibration, no new force ideas are needed. There are other causes of failure introduced by vibration, such as scuffing and fatigue, but the force that will cause failure in vibration is of exactly the same magnitude as the force that will cause an identical failure in shock. This means that the "G" factor considerations will be exactly the same too.

Resonance And Frequency

Resonance is the condition of vibration under which forces of the greatest magnitude are developed. This is the condition in which the forcing or driving frequency is exactly the same as the natural frequency of the packaged product, but is 90 degrees out of phase. You can get a good idea of this effect if you will stand on the bumper of your car and work your body up and down in unison with the action of the suspension system. Your weight can only cause the car springs to deflect a small portion of the total motion caused by your forcing action.

In the motion of your car the frequency is low due to the heavy mass involved. In packaging we encounter lighter weights having higher natural frequencies. The principles involved in resonant motions are the same, however, and the resulting forces can and do cause serious damage to packaged products.

There are many ways in which a package can be subjected to vibration. All of the common carriers vibrate in one way or another and with varying frequencies. One damaging vibration is that which may occur in the hold of a ship due to the rotary motion of the propeller shaft. This vibration is not particularly violent but it is continuous, sometimes for weeks. If the forcing frequency of the propeller shaft happens to match the natural frequency of a product or a part of a product, resonance occurs and serious damage can be expected. In such cases the damage may not be apparent from the outside of the package, it having been brought about by a sympathetic motion of the product itself.

Measurement Of Forces

Accurate measurement of acceleration forces inside a package can only be accomplished by the use of a calibrated accelerometer and the necessary electronic sensing equipment. The accelerometer is applied directly to the product in the package and is connected to the sensing equipment with flexible wires which permit dropping or vibration while the connection is in working order. Such a set-up will give the actual acceleration forces that are being applied to a product while it is under test in a package.

For the checking of shock forces only, a calibrated shock machine may also be used. Such a machine will provide decelerations of up to 200 G's under controlled laboratory conditions. It cannot be used to check the forces encountered in vibration. For that purpose, the more complicated accelerometer-electronic equipment must be used.

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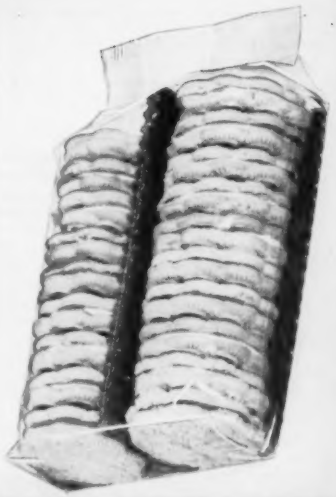

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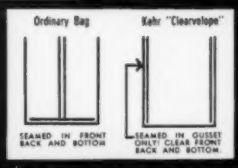

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Silicone Treatment

Dow Corning Corp. announces Syl-Gard 17, a silicone protective treatment developed to reduce breakage

of bottles such as used as returnable containers for beverage and dairy products. This product is a liquid concentrate suitable for instant dilution in water. Equipment is available to spray it on bottles as they pass through the filling line, thus giving each bottle a non-oily, silicone lubricating film that reduces scratches and abrasion, according to Dow Corning. It is available in one-shot bottles, each containing 8 fluid oz. The producer says that each bottle, mixed with water in an 8 to 15 gallon spray fluid tank, supplies enough solution for a day's production on a single filling line. Circle No. 1.

Parts-Feeder and Counter

U. S. Engineering Co. reports development of its 20" Hoppermatic, a parts-feeder and counter handling up to 200,000 parts an hour. Special features of this particular size unit include a longer discharge track than that of standard Hoppermatic models, ball-bearing support for the outboard portion of the drum, and space for the accommodation of two to five tracks, according to the producer, who notes also that there is a larger opening for loading and greater storage capacity in the hopper. The unit is driven by a 1/15 h.p. gear head motor and the knock-off wheel is driven by

a separate 1/70 h.p. knock-off motor. Circle No. 2.

Glass Bottle Crimper

Mojonnier Associates, Inc. reports development of its high-speed glass bottle crimper that is interchangeable

with the can crimper head. The company says that this unit crimps valves to glass aerosols at speeds up to 60 per minute. It does this operation automatically. Circle No. 3.

Sheet For Thermo-Forming

E. I. du Pont de Nemours & Co. announces Alathon 31, a new polyethylene resin tailored for use in making heavy sheet for thermo-forming. It has a melt index of 0.6 and a density of .930. Du Pont says this melt index is the optimum for such a resin and that its density gives a high degree of stiffness to the finished part or permits the use of a thinner wall section. The producer also notes that it also has a high enough viscosity to resist sagging during the preliminary heating step of the thermo-forming process and at the same time is readily extruded into sheet and shaped into finished work when drawn down over the thermo-forming mold. Circle No. 4.

Gummed Tape Machine

Better Packages, Inc. has a new, electronically-controlled gummed tape machine, known as Tape-O-Matic No.

3. The unit has a four-key selector, which mounts either on the machine or away from it, as desired. Operating keys may be set for any length of tape from 6" to 60" and handles standard string-filled or reinforced tape from 2" to 3" wide. Tempered steel feed rolls are separated 1/32" after each feed, to avoid side creep of tape, Better Packages notes. The unit provides electronic measuring without resetting. It has oversize solenoids and a built-in water heater in protected mounting. Circle No. 5.

Label Dispenser

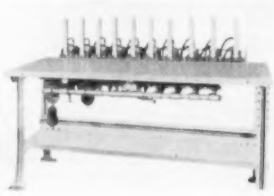
Archer Label Co. announces its Model 900 manual dispenser for self-adhering labels. It handles rolls of labels as large as 9" wide and has

a thermostatically-controlled heating unit which makes the labels dispense rapidly and apply quickly, according

to Archer. Use of a machine this wide permits dispensing labels in rolls of sizes which previously had to be separated from the carrier sheet by hand, the producer notes. Smaller sizes may be dispensed in greater multiples with this width of label dispenser. Circle No. 6.

Multiple Stapling

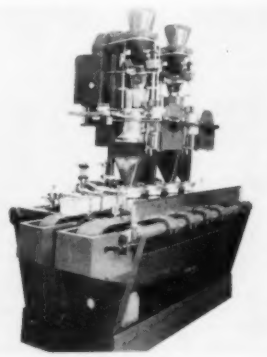
Container Stapling Corp. announces development of stapling heads for multiple operation equipped with manifold connecting plates. This



makes possible connecting in series as many heads as may be desired to drive several staples simultaneously. Magazine capacity is 100 staples, except for extra length magazines capable of holding 200 staples. These Automagic stapling heads operate without electrical connections, using only compressed air. The manufacturer says that lubrication is fully automatic by means of a valving arrangement that continuously exhausts nebulized oil over moving parts. Circle No. 7.

Net Weighing Equipment

B. F. Gump Co. has a new Bar-Nun Auto-Check net weigher, designed for installation in multiple units in high



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speed can lines. This equipment is available in eight sizes, to automatically feed, weigh-fill, pack, and eject cans to closing machine conveyors at speeds ranging from 15 to 145 a minute. Gump says that the accuracy of the machine on 1 lb. weights of recommended materials is within 1/64 oz., plus or minus. Weight range of the standard unit is 8 oz. to 2 lbs. Air pistons and electrical controls simplify the indexing, can handling, and packing mechanism. It has a power feed that permits the weighing of a wide range of dry, powdered, and granular materials, even those of very fine, pulverized products, according to Gump. Circle No. 8.

Dispensing Plug

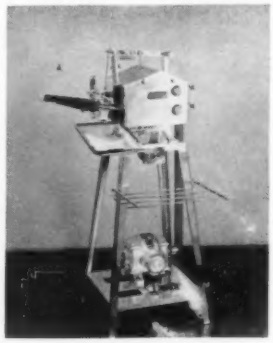
Plax Corp. announces a new fitment, an all-polyethylene dispensing plug designed to control with accuracy the amount of fluid dispensed with each drop. Plax says its one-piece fitment eliminates the steel ball typical of controlled droppers. Plax also says that the fitment is sufficiently sensitive that it does not jet and that this dropper becomes an integral part of the package. Circle No. 9.

Coiled Adhesives Unit

United Shoe Machinery Corp. announces a new applicator for its rope-like, hot melt adhesives that are supplied in coils. This applicator has a transfer wheel unit instead of a nozzle so that it can be used on intermittently processed materials. The adhesive is melted by the unit and applied through a nozzle. It unreels from the coil as it is consumed. Circle No. 10.

Two-Color Printing Unit

Chemical and Pharmaceutical Industry Co., Inc., announces the availability of its Marzocchi automatic ro-



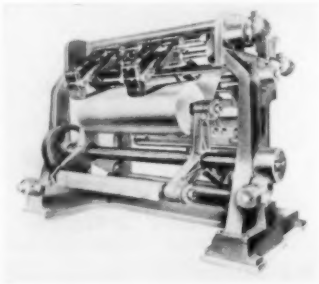
tary ampoule printing machine, designed to print cylindrical objects up to a diameter of 1" to 1-1/4". It prints two colors simultaneously and operates at a speed of 1600 to 2000 objects an hour. The company says it will imprint all types of materials such as glass, plastic, box-board, and wood, as long as the objects are cylindrical. Printing plates may be furnished with interchangeable types of printing, such as control, lot number, expiration dates, etc. Circle No. 11.

Automatic Packaging Unit

Hayssen Manufacturing Co. announces its new Model G single tube Compak machine. It is equipped for automatic net weight scales and elevator lift for floor loading. It is a counterpart of Hayssen's Model F dual machine, but incorporates new design features in addition to the single tube. It has all rotary mechanisms for operation of the equipment. Designed for the automatic packaging of items such as candy, it has been developed for its flexibility to accommodate short runs, according to Hayssen. Circle No. 12.

Automatic splicing

Parsons & Whittemore Graphic Corp. announces the Cerutti electronic unwind roll stand that permits full-



speed automatic splicing. Adaptable to any web-fed press, this roll stand features star-type roll arms that rotate automatically when the expiring roll reaches a predetermined minimum diameter. Taking rolls up to 90" wide, the unit has three roll shafts and the equipment is designed to effect a splice at full press speed. A duplex model of this roll stand is also available for semi-automatic splicing at speeds up to 400 f.p.m. and is available in widths up to 48". Circle No. 13.

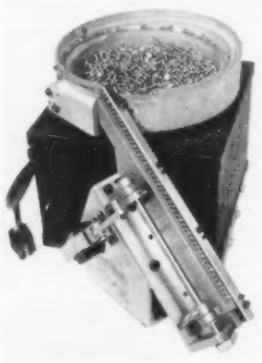
Stencil Ink

Reynolds Ink, Inc. announces its blockout or obliterating fluids in an aerosol container, known as Stencil-

Kover. This product serves the blocking out of marking errors, thus allowing the restenciling of boxes. Similarly, this product dries in two to three minutes and is available in a tan color in a 12 oz. can. Its use permits the obliterating of stenciling on boxes in order to restencil it — such as for reshipment. Circle No. 14.

Automatic Feeding Machine

Mercury Heat-Sealing Equipment Co. reports development of its Model Xa automatic screw feeding machine, a



self-contained unit that can be attached to a packaging machine where it fills bags automatically with a predetermined number of screws or other such items. It counts accurately in units of from one to 24 at the rate of 250 per minute on a single track and 500 on a double track, according to Mercury. Setting a selector arm determines the desired quantity or number of screws per unit. Operation is automatic and the only attention necessary is the bulk filling of the feeder, Mercury notes. Circle No. 15.

"Dial" gummed tape electrically

The new Marsh Dial-Taper is real news to users of gummed tape. Dispenses all kinds, in widths to 3", electrically. Select your length on the telephone-type dial, dial it, and out it shoots moistened with warm water. Sticks instantly. Saves 1/5 on tape, often more in man-hours.

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DT-11

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Photoelectric Relays

Photobell Co., Inc., announces its type RPF1 photoelectric relay, a general purpose, non-adjustable unit just 4½" high and built into a standard 1-gang conduit box. Photobell says these are made without amplifier tubes and are designed around a new high-power photo cell. The RPF1 unit is designed to be directional and to control 5-ampere SPDT contacts. Circle No. 16.

Automatic Applicator

Kleen-Stik Products, Inc., announces its "D" transfer tape applicator, designed to apply its Kleen-Stik strips from a roll. It handles tape of ½" or 1" width and applies over 50 feet a minute. Micro-switches release the feeding finger, which lays the tape upon the printed piece on which the pressure sensitive strip is to be positioned. A second switch cuts the tape at the desired length. Guide rails control the accurate positioning of the tape. Finished pieces stack on the delivery ramp at the end of the applicator unit. Circle No. 17.

Self-Sealing Packaging

Kennedy Car Liner & Bag Co., Inc., announces that its Zip-Lip bag is now available in sizes ranging from 3" x 4" to 13" x 23" in three, four, or five mil polyethylene. Such bags use a tongue and groove principle to provide a tight closure by finger pressure and easy opening by pulling the fastener apart. Kennedy says this provides a dust-proof, leak-proof, airtight and watertight bag for both consumer and industrial products. Circle No. 18.

Strip Gluer

Potdevin Machine Co. anounces the addition of a new dryer to its topside strip gluer. The size of dryer is held to a comparatively small dimension by placing the conveyor from the gluer at right angles, Potdevin notes. This permits glued sheets to shingle on the conveyor belt, exposing the glued edge only. Although designed primarily for small shop use, the equipment can be furnished with automatic feed in varying sizes — for long run requirements. A control dial regulates the distribution of glue to the glue roller. Circle No. 19.

Teflon Impregnated Tape

The Connecticut Hard Rubber Co. reports development of Temp-R-Tape TG, a pressure-sensitive Teflon impregnated fibreglass tape. It has an effective temperature range of -100°-F. to 400°F. and has an adhesion of 32 oz. Its producer says it has greater dimensional stability at higher temperatures and better abrasion resistance than plain Teflon tape. It is available in ½", ¾", 1", 1½", and 2" widths in 12-yard rolls. It is 10 mils (0.010") thick. It is also available by the lineal yard 12" wide, and can be cut or died-out in various shapes. This tape is designed to reduce destructive sticking, build-up, wear and friction on machinery. Circle No. 20.

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Stapling, Tacking Units

Fastener Corp. offers a 28-page catalog which describes and illustrates its complete line of Due-Fast manual and air-operated stapling and tacking equipment. Model numbers of each item, the type of staples that may be used, and special features for different users are included. Description of guides, attachments, and other accessories available are enumerated also. Circle No. **101.**

Electric Eye Lighting

Ess Instrument Co. offers Bulletin No. 574, announcing miniaturization of light sources and photo units for use with the company's miniaturized "electric eye" photo controls, developed for automation and production applications. Units are 5/16" in diam. and 2¼" long. In addition to reduction in size, the photo units have high sensitivity, making them operative with small light values — either directly from the miniature light source or reflected from surfaces, according to Ess. They are adapted for use with Ess' IRC-5 miniature controls. Circle No. **102.**

Tubular Packaging

Niemand Bros. has issued an illustrated brochure describing its complete line of tubular paper packaging products. This brochure details its custom built and industrial packaging products, dispenser packages, goose neck packaging, and similar units. Niemand says that its products can be designed and produced to a wide variety of specifications and requirements. Circle No. **103.**

Textile Wrapping Machines

Battle Creek Packaging Machines, Inc. has a data sheet giving technical specifications of three of its wrappers especially suitable for textiles. Floor space required, sizes handled, types of packaging materials handled, speeds per minute, electrical data, and other specifications are enumerated. Circle No. **104.**

Aerosol Test Tank

Island Equipment Corp. describes its new Styl-O-Matic heat and leak test tank in Bulletin AT-1. The unit is designed for testing aerosols automatically and consists of a tank and a movable chain belt that carry the aerosol down into the tank and up out of it. Chain is available in widths for either single or double rows of aerosols. The unit serves as both a heat and/or leak test tank. Drawings and specifications are included. Circle No. **105.**

Cushioning Material

Flex-O-Laters, Inc. offers a sample card describing Edg-Pak, a new cushioning material that protects breakable or easily chipped edges. The material, which is available in three types, grips and cushions edges up to ½" in thickness through inner spring wire construction. The spring cushion is woven into inner padding and covered completely with X-Crepe. The company suggests its use for edges on plate glass, metal and wood panels, windshields, porcelain fixtures, and other breakable edges that need protection. Circle No. **106.**

Automatic Cartoning

Bivans Corp. describes its automatic cartoning machines in a four-page brochure. The company says it produces automatic cartoning machines and accessories to provide an automatic cartoning system. Machines are illustrated, with specifications and operating information included also. Circle No. **107.**

Tableting Details

Arthur Colton Co. has issued Colton Comments, Vol. 2, No. 1, giving punch and die interchangeability tables for its rotary tablet presses. The line of redesigned heavy duty, high speed, single-rotary tablet presses with increased compression pressure is described in this four-page folder. The company's progress in the development of a new press coating machine to apply dry coatings to compressed tablets at rates up to 900 tablets/min. is also outlined. Circle No. **108.**

Checkweigher

Bartelt Engineering Co. describes its automatic checkweigher in a 4-page brochure. Handling rectangular packages up to 4½" by 7¾" base size, and round containers up to 5⅛" dia., it provides increased weighing accuracy up to 130/min. It automatically by-passes overweights and underweights to two or three-way segregation lines. Circle No. **109.**

Bucket Elevating Conveyors

Lynch-Robo Corp. offers an illustrated bulletin on the "Robo-Lift" bucket elevating conveyor. Used in loading filling machine hoppers, this machine smoothly transfers product in interlocking buckets. It moves horizontally, diagonally and/or vertically. Any number of pick-up and discharge stations can be provided. Circle No. **110.**

Marking Equipment

Markem Machine Co. data sheet lists Model 70ABA in-line production marking machine for cartons, fibre containers and other flat or nearly flat surfaces. The machine is a printing unit for mounting on a conveyor line or it can be used in conjunction with packaging machinery. It is activated by air pressure and uses insertable type or rubber printing plates. Maximum imprint area: 2" by 6". Speed range: approximately 3,600 imprints per hour. Circle No. **111.**

Unit Packaging Equipment

Conapac Corp. has a 4-page folder describing its Model B and Model K Roto Wrap equipment. Model B handles packages from ¾" to 6" wide and from 1-9/16" long upward. Model K handles strip packaging of products up to 1" in dia. Specifications of each machine are included in the folder. Circle No. **112.**

Specialty Films

Dobeckmun Co. folder explains the different combinations of films used in manufacturing "Durafilm," a custom-made transparent material designed for its toughness. Brochure includes prices and specifications for various grades of this material. Circle No. **113.**

Label Paster

Potdevin Machine Co. has a data sheet picturing its label paster and coating machine with a semi-automatic friction demand feed. Available in 6", 9", or 12" widths, it handles ungummed labels of 2" minimum length. The touch of a lever delivers a coated label ready for application. Circle No. **114.**

Automatic Cartoner

Container Equipment Corp. describes its Model 40 cartoning machine in a current bulletin. It automatically moves cartons from flats in the hopper to the closing or sealing stations, allowing for hand insertion of the product. Producing sealed cartons up to 90/min., machine handles glue seal cartons, straight tuck cartons, reverse tuck cartons or any combination of these. Carton sizes handled range from 1" long, ½" wide, 1¾" deep, to 10" long, 5" wide, 30" deep. Circle No. **115.**

Band Type Heat Sealer

Ralph Chaffee & Co. offers a bulletin "Production Line Heat Sealing." It describes its metal band type Rotor-Sealer which is adapted to heat sealing moisture-proof films at speeds up to 315" per min. Circle No. **116.**

Label Gluer

King Sales and Engineering Co. offers a two-page bulletin on its Model F6 label gluer. Line drawings illustrate machine details and halftones show in-plant usage, and detailed specifications are listed—for motor- and hand-driven units. Circle No. **117.**

Adhesives

Swift & Company offers a leaflet "Canning Adhesives," that describes and lists applications of 25 different types of adhesives, including hot pick up gums, lap end label pastes, metal and bottle labeling adhesives, case sealing and palletizing adhesives. Circle No. **118.**

Fibre Cans and Tubes

The Cleveland Container Co. has a packaging brochure that provides detailed construction drawings of its line of convolute and spirally-wound fibre cans, tubes and specialty metal closures. These packages are suitable for all types of dry, granular products in the food, drug, and chemical specialties industries as well as for spare parts, hardware items, etc. Cans are lined with moisture, grease resistant and anti-corrosive liners. Circle No. **119.**

Non-Drip Can

American Can Co. offers an eight-page booklet describing a non-drip container suitable for the packaging of a wide variety of liquid products such as edible liquids, detergents, window cleaners, liquid wax, tonics, shampoos, paint thinners, etc. A special nozzle provides free pouring that won't drip afterwards. The container fills quickly and easily and is available from Canco plants throughout the U.S. Circle No. **120.**

Polystyrene Packages

The Dow Chemical Co. has published a 24-page catalog supplement of 60 different styles of polystyrene packages. Each package type is pictured; size and color specifications are included, as well as the name and address of the plastic molder who can supply each package. Range of containers includes round, square, rectangular, and basket packages as well as vials and tumblers. Circle No. **121.**

Packaging Film Adhesives

National Adhesives, Div. of National Starch Products, Inc., has a handy booklet describing how to handle adhesives for transparent films. The characteristics and applications of lacquer, hot melt, and solvent activator adhesives are explained in detail. There is a discussion of problems relating to penetration, aging, and storage as well. A separate chart is inserted which reviews 14 different transparent films, listing their means of identification, their manufacturer, trade name, thickness, types, and characteristics. Circle No. **122.**

Automatic Wrapper

Hudson-Sharp Machine Co. has a four-page folder featuring the Campbell Wrapper. This is an automatic machine handling all types of modern wrap materials, tube forming them around the product. It then simultaneously crimps, cuts, heat or glue seals, folds and delivers. The machine gently handles hard, soft, and brittle products of regular or irregular shapes without breaking or crushing; it is said to reduce material requirements by 35% to 50%. The unit wraps without boats or stiffeners unless they are desired, and can be supplied with such accessory equipment as code daters, label imprinters, strip opening attachments, etc. Circle No. **123.**

Carton Overwraps

Shellmar Betner Div., Continental Can Co., offers Bencoseal, a laminated foil carton overwrap or box liner in a current folder. This lamination provides high moisture-vapor protection and produces a tight heat seal. It can be gravure printed in seven colors and is available in two basic types: one is designed for products which must undergo refrigeration and high moisture conditions, and the other recommended for wrapping cartons made with thin, flexible board. A table is included showing a comparison of moisture-vapor transmission of this material compared with other types for such products as cigars, pecan cookies, cracker sandwiches, and detergent chemicals. Circle No. **124.**

Corrugated Boxes

Hinde & Dauch has published a comprehensive 30-page catalog of packaging ideas entitled "How To Pack It". Well illustrated with photographs, it describes each of 75 different corrugated box designs that are available, emphasizing product protection and reduction in packing and handling costs. Circle No. **125.**

Heat Resistant Boxes

Stone Container Corp. lists the advantages of the Sta-Temp container in a current brochure. This is a one-piece box with a fold-over top, made of corrugated board laminated on the outside with .00035 aluminum foil. This package is said to keep heat-perishable products below the spoilage point almost twice as long as plain corrugated boxes. It can be readily set up and does not require stapling. Circle No. **126.**

Paper Web-Wetters

Walton Laboratories, Inc., lists specifications and prices for seven models of its moisture conditioners for moving fibrous webs. Mechanical drawings are included. Circle No. **127.**

Pouch-Making Machines

Simplex Packaging Machinery, Inc., offers bulletin SPM-4-754-75C which illustrates and gives specifications for two models of automatic pouch-making machines. Using coated paper, scrim, laminated films, etc., one model offers a pouch size range from a minimum of 1½" x 3½" to a maximum of 12" x 20" within a speed range of 56 to 90 pouches/min. The other model, designed for heavy duty and military packaging, features a pressure indicator and makes pouches from 3" x 3" to 24" x 30" at speeds from 24 to 48 pouches/min. Circle No. **128.**

Adhesives

The Arabol Mfg. Co. offers a handy check-list comprised of 23 basic questions to be considered when preparing specifications for packaging adhesives. Answers to these questions can help you determine what qualities and characteristics you most need for a specific adhesive job. Circle No. **129.**

Net Weighers

Triangle Package Machinery Co. has a six-page folder that describes the operating details of six different models of its net weighers. These machines are adapted to operate with hopper feeds for free-flowing products and with elevating conveyors for such products as candies, pretzels, cookies, etc. Filling into cartons, bags, cans, or jars, weights filled range from a fraction of an oz. to 5-lbs.; speeds range from 12 to 40 pkgs./min. A written guarantee for speed and accuracy is made with each machine. Circle No. **130.**

Carton Forming Machine

The Ohio Boxboard Co. has a bulletin describing the Peters-Ohio Midget, an automatic tray gluing machine. Producing up to 40 boxes/min., this unit is convertible from size to size in 20 min. or less. It forms most standard glued trays, telescope styles, hinged display cartons, etc. This machine is available in two models, depending upon carton size requirements, is mounted on casters for portability, and requires 36" x 50" floor area; it is 83" high. Circle No. **131.**

Flexible Packaging Materials

Glassine and Greaseproof Manufacturers Assoc. has published a comparison table showing the water vapor permeability of 17 different flexible packaging materials as determined by TAPPI Standard Methods. Circle No. **132.**

Weigher — Bag Filler

Union Bag-Camp Paper Corp. has a six-page brochure on the I & C Bagger. This is an automatic weighing and filling machine for open-mouthed bags, corrugated, metal, and other rigid containers. Handling dry, granular products, it has a capacity from eight to 90 tons/hr., filling containers from 10 lb. to 200 lb. capacity. This machine features a weigh hopper that is suspended from scale levers and which is controlled by a calibrated dial cut-off that eliminates check weighing. Change of weights can quickly be made by selector knobs. Circle No. **133.**

Wrapping Machines

Oliver Machinery Co. has issued Bulletin No. 550815 that describes Oliver automatic wrapping machines. These units wrap a wide variety of articles of rectangular or irregular shapes such as cakes, cookies, candy bars, frozen foods, dried fruits, textiles, etc. It can overwrap cartons, trays, U-boards, and flat cards, or the product may be wrapped without any support. These machines handle waxed paper, glassine, cellophane, or almost any other heat-sealing material. This folder also describes a label imprinter and a package-top labeler that handles thermoplastic labels. Circle No. **134.**

Multiple Cartoning

Robert Gair Div. of Continental Can Co., Inc., offers a new multiple-packaging machine which is described in a current bulletin. The Jak-Et-Pak Machine can be arranged to handle cans from 2⅝" to 7¾" in ht. and from 2¼" to 3¾" dia., covering the full range of can sizes from small frozen orange juice to quart beer can size. Carton blanks wrap around the cans from the top down, locking and gluing on the bottom. The unit handles crown top cans as well as flat top cans at speeds up to 120 carriers/min. Circle No. **135.**

Glass Container Rinser

Standard-Knapp, Div. of Emhart Mfg. Co., offers Bulletin 68-3 which illustrates and describes the operating features of the Standard-Knapp Rinser. This machine operates at high speeds and is used for rinsing new bottles or jars with hot water. Containers are then drained and discharged to a conveyor, ready for immediate handling in the packaging equipment. Detailed mechanical drawings are included. Circle No. **136.**

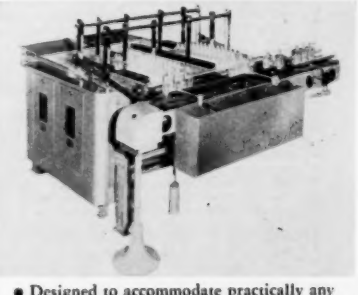
Carton Forming and Closing Machines

Peters Machinery Co. outlines specifica-

NEW! High Speed

WALKIE-PUSHIE

UNSCRAMBLER



● Designed to accommodate practically any size or shape container at speeds up to 400 to 450 per minute. Bottles, jars and other containers are unscrambled *without agitation* and transfer from chain to walking beam is very gentle, without any contact of containers. Invaluable in the distillery for odd shape flasks, in the drug and cosmetic industry for unusual after-shave and hand-lotion bottles, as well as other industries wherein not only round but also unusual shapes and sizes must be handled at high speeds.

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tions for seven different models of carton forming, folding, and closing machines in Bulletin CR-56. Various models handle packages at speeds from eight to 175 or more cartons or trays/min. Other units are available that both form and line cartons. Floor plans for this equipment are included. Circle No. **137.**

Polyethylene

Spencer Chemical Co. has a group of data sheets describing the properties of five different grades of Poly-Eth polyethylene material. The different grades of this material are designed for the extrusion of blown and flat film, and for film extrusion and extrusion coating. Characteristics are listed in tabular form and cover such factors as color, form, melt index, tensile strength, yield point, elongation, etc. Circle No. **138.**

Vacuuming and Sealing Machine

The Cryovac Co. offers an illustrated information sheet describing the Vac-all machine used in the vacuuming and sealing of sliced luncheon meats, cheese, and other food items. Operating from a 110/115 volt outlet, this unit can seal from 10 to 15 pouches/min., handling any pouch size from 3″ to 10″ wide. Circle No. **139.**

Pliofilm

The Goodyear Tire & Rubber Co., Inc., has prepared a brief, non-technical description of Pliofilm and its more common uses in Bulletin A-6427-K. Comprised of 18 pages of useful information, this booklet also lists tables showing the yield of Pliofilm in eight standard gauges as well as physical test data on 36 different grades of this material. Circle No. **140.**

Self-Sticking Tape

Permacel Tape Corp. pictorially demonstrates 80 practical packaging ideas using self-sticking tape in a current 44-page book. Application of these tapes in wrapping, bundling, bag sealing, can and drum sealing, unitizing, and palletizing, etc. is illustrated and described. A table is included which lists descriptions of 37 packaging tapes, nine of which meet government specifications. Circle No. **141.**

Corrugated Bulk Containers

Gaylord Container Corp. lists nine ways you can save packing and shipping costs by using corrugated bulk containers in a current bulletin. Holding up to 2000 lbs. of bulk material, these containers are sift-proof and are suitable for handling powders, flakes, chips, lumps, pellets, sticks, etc. Circle No. **142.**

Imprinter for Hard or Soft Surfaces

Adolph Gottscho, Inc., manufactures an imprinting machine described in Bulletin RIN-4. When attached to a wrapping machine, it accurately positions printing of code dates, prices, weights, etc. on cellophane, polyethylene, Pliofilm, etc., as well as standard kraft and other paper surfaces. When adapted to a conveyor or package machine handling cartons, cases, cans, etc., it prints on the top surfaces of these packages. This unit, the Rolaprinter Series 700, features a flexographic ink system which uses fast drying liquid pigment inks. Circle No. **143.**

Foot Operated Heat Sealer

Doughboy Industries, Inc., has a new folder describing two models of a foot operated jaw-type heat sealer. One model is designed to handle cellophane, glassine, coated papers, foils, etc., and is available with smooth or serrated jams. Jaws are 8″ or 10″ long, and wattage, 300 to 400. The other model seals polyethylene, Pliofilm, and other plastic films, and is available with 8″, 10″ or 12″ jaws, and wattage, 200 to 300. These sealers are said to insure delivery of predetermined jaw pressure irrespective of foot action. Coding and hole punching devices are available as optional accessories. Circle No. **144.**

Label, Tag, and Carton Presses

New Era Manufacturing Co. offers a handsome 24-page bulletin that reviews its line of flat-bed printing presses, which can print, die-cut, score, and strip labels, tags, and cartons in one continuous operation. These units are high speed, web fed presses that print from electros, type, plastic, or rubber plates. Specifications for these machines are included. Circle No. **145.**

Rotary Vacuum Filler

U.S. Bottlers Machinery Co. manufactures six basic models of rotary vacuum fillers incorporating 14 adaptations as described in a current catalog. Photographs and mechanical drawings are included in this brochure, which also provides a detailed description of each integral part of the equipment. These machines are designed to fill still liquid products of either light or heavy consistency, at speeds ranging from 12 to 300/min. depending upon container size and product viscosity. Circle No. **146.**

Pressure Packaging

Crown Cork & Seal Co., Inc., offers valuable information to anyone considering an aerosol package. A complete section is devoted to important technical information that includes such subjects as an explanation of how pressure packaging works, a discussion of products packaged with liquified gas and compressed gases, a check list of basic steps to pressure packaging your product, container selection and specifications. Inserts are included that give important public regulations affecting pressure packaging, and a helpful list of aerosol consultants and laboratories, as well as a listing of contract aerosol packers throughout the U.S. and foreign countries. Circle No. **147.**

Vacuum Fillers and Body Labelers

Biner-Ellison Machinery Co. manufactures a line of fillers and labelers that are described in a current catalog. Specifications and pictures are given for nine different machines, some of which fill and label simultaneously. The fillers are designed to vacuum-fill still liquids, and the labelers apply body labels, handling a wide range of glass containers and label sizes. Circle No. **148.**

Bundling Machine

Wrap-King Corp. has an illustrated data sheet listing specifications for the Model B Bundler. Using cellophane, glassine, kraft paper, plastic base films, etc., this machine can bundle products for the automotive, bakery, drug, food fields, etc. Speeds range from 30 to 80 bundles/min., within a size range of 2½″ to 12″ long, and 1½″ to 6″ wide and ⅛″ to 3¼″ high. Automatic printing of wrapping material can be achieved with accessory equipment. Circle No. **149.**

Cushioning Material

Kimberly Clark Corp. provides a good deal of interesting information about Kimpak in Bulletin KKB-1-6. This is a lightweight cushioning material for interior packaging. Profusely illustrated, this booklet reviews such packaging requirements as blocking and bracing, flotation, absorbency, and surface protection. Circle No. **150.**

Glass Container Labeler

Economic Machinery Co. gives specifications and description for two models of the World Turret Labelers in Bulletin TU-267. These machines can apply body labels, body and shoulder labels, or body and wrap-around neck labels, on any type of round, oval, paneled or fluted glass containers, including bottles, tumblers, jars and flasks. Featuring quick change-over and a No Bottle-No Label control, these units offer a speed range from 70 to 160 bottles/min. Container range is from 1″ to 4″ dia., 2½″ to 13″ high, and label range is from 1″ to 7″ high, 1″ to 5½″ wide. Circle No. **151.**

Adhesives and Coatings

Raybestos-Manhattan, Inc. offers Bulletin No. 650A describing its Ray-Bond adhesives, protective coatings, and sealers. This four-page bulletin includes a tabular review of the properties, application methods, and use of eight thermosetting and thermoplastic materials. Also included is a graph showing the shear strength of five thermosetting adhesives in the temperature range from 100° to 650° F. Circle No. **152.**

Testing Procedures

National Safe Transit Committee offers individual copies of its latest test procedures booklet. This covers NST Projects 1 and 1A. Project 1 covers the testing of packaged products weighing 100 pounds or over, and Project 1A covers the procedure for testing packaged products weighing under 100 pounds. Circle No. **154.**

Bottles and Caps

W. Braun Co. offers a new catalog reviewing its glass and plastic containers, as well as its closures and ceramic labeling. This 104-page book contains detailed descriptions, as well as illustrations of the various containers and closures, and has an illustrated glossary of trade terms and simple conversion factors. Containers are described by finish, mold number, height, width, thickness, pack, and weight per gross. Circle No. **155.**

Evaluating the packaging requirements of a product

(Continued from Page 25)

needs of the product must be determined before a suitable package can be developed. Without this information any testing of proposed packages can be a waste of time and effort, to say nothing of money. And, unhappily, the proposed package that may be evolved without the basic data from which to proceed may easily turn out to be useless in providing the required protection, although it may present a pleasing appearance.

In engineering a package the basic requirement data must first be obtained. It should be the responsibility of the packer to study his products and learn accurately just what they need in the way of protection. If he will perform his proper function, the development of a suitable package can be done in much shorter time by the supplier. Up to now there are no short cuts in measuring the needs of a product.

Hydraulic Embossing

Champlain Co., Inc. has a leaflet illustrating and describing its heavy-duty embossing unit. This equipment can be used in line with either fabricating and printing equipment or reel-to-reel applications. It has a circumferential range from 20" to 36". Specifications and operating details accompany the drawing. Circle No. **156.**

Self-Sealing Containers

Growers Container Corp. offers a folder describing its self-sealing corrugated containers. These boxes have flaps that are dry to the touch and are factory-treated with Presseal, so that the flaps adhere to each other at finger pressure. Although these flaps adhere to themselves, they will not stick anything else, Growers says. Circle No. **157.**

Polyethylene Tubing

Andmar Plastic Co. has a four-page bulletin containing specifications of polyethylene blown tubing. It has details such as yield, yardage, gage variation, edge alignment, wind, splices, and clarity. Circle No. **158.**

Foil Baking Pans, Trays

Kaiser Aluminum have a new 8-page catalog describing their Foil Kraft aluminum foil pie plates, baking pans, and custom designs. Each type is illustrated. Charts give dimensions, capacities, rim styles, and guages available for each type. Circle No. **159.**

Urethane Foam

Mobay Chemical Co. has a 20-page booklet reviewing the details of its urethane foams. Not only are their properties and performance features illustrated and described, but also a range of applications are included. Circle No. **160.**

Industry literature available free starts on Page 54.

CLASSIFIED ADVERTISING

Our classified advertising section is intended for use by those wishing to buy or sell used packaging equipment, to employ packaging personnel, seek such employment, offer or seek business opportunities. It is not available for general advertising. Terms: Cash with order. Rates: Up to 60 words, $10.00. If boxed, $20.00. Up to 120 words, $20.00. If boxed, $40.00. Up to 180 words, $30.00. If boxed, $60.00.

Circulation this issue in excess of 35,000

POSITION AVAILABLE

Packaging Engineer with at least five years experience with packaging materials and machinery. State education and experience. Reply to Box 702, Package Engineering, 1791 W. Howard St., Chicago 26, Illinois.

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MACHINERY WANTED

Wanted — A late model Hudson-Sharp Campbell Wrapper, Model .2W6 or 2W8. Reply to Box 701, Package Engineering, 1791 W. Howard St., Chicago 26, Illinois.

FOR SALE

For Sale — Packaging machine, Battle Creek Model BT30 and Bond M L Dual Filler. Fills, seals folding boxes, both bottom and top. Continuous flow principle. Quickly convertible. Wide range of boxes up to 10 inches in height, 30-40 per minute. Price new machine $15,120.00; this used one $5,000.00. Reply to W. J. Wittekind Company, 1041 Richmond Street, Cincinnati 3, Ohio.

For Sale — Packaging machine, Corley-Miller MP Wrapping Machine and Corley-Miller Sheeter Gluer. Purchased in 1951 at $4795.00, used six months, in storage since 1951. Excellent condition; not used because company has eliminated wrapping operation. Price is $1200.00. Contact Mr. J. W. Kehoe, The Shelby Salesbook Co., Shelby, Ohio.

As package users give more and more attention to statistical quality control and container inspection plans, it becomes increasingly evident that far too few of those who write package specifications know enough about the manufacturing processes of their container suppliers. This is unfortunate because a working knowledge of these processes is virtually a prerequisite to the task of writing specifications.

It happens that certain well-known companies have developed extremely rigid packaging material and container specifications. In these they enumerate and prescribe measures for almost every specific detail lending itself to anything approaching exact measurement. Usually a fully-detailed, statistical quality control program and sampling plan go hand in hand with these specifications.

What it takes to write good spec's

As the word has gotten around, it appears that a good many other companies have sought to establish packaging specifications and similar details. Unfortunately, not too many of those who write such specifications have enough comprehension of the suppliers' manufacturing art on which to base these spec's.

The result is that a container may fully meet every one of an extremely long enumeration of requirements — and yet fail on the production line. It often happens that the folks who drew up these spec's did not phrase them to cover the *necessary* requirements. On the other hand, some specifiers of material and containers have failed to comprehend such important points as the manufacturers' tolerances. They are at a loss to understand why a particular glass bottle may need a tolerance of plus or minus 1/16" on its height.

Need to know basis for tolerances

To the uninitiated, it might appear that the bottle manufacturer could hold his tolerances to a lesser measure than 1/16". What happens is that in the course of bottle production the molds from which they are made need repolishing — cleaning up, for example, with a soft emery cloth. Because of this treatment, the mold dimensions change. Ultimately (say, after 120,000 gross bottles) the mold needs replacing.

The man who insists on less than that tolerance is going to have to replace molds with much greater frequency than those who accept the tolerance. Usually such replacement is unrealistic or prohibitive. More sophisticated users learn to live with the generally accepted tolerances.

All this emphasizes that the preparing of container specifications rests on adequate knowledge of the suppliers' manufacturing processes and on a thoroughly cooperative basis of understanding. Only the naive would seek to draw up container specifications without sitting down with their suppliers for the most thorough-going of discussions and exchange of views and requirements.

Ultimate dependence on supplier integrity

In this sort of discussion, the man who does not know and understand what goes on during the container manufacturing operations is at a disadvantage. On the other hand, those having such knowledge can launch intelligent and fruitful conversations with their suppliers.

In last analysis, the most articulate of quality control efforts is no substitute for the integrity of the container supplier. No specification, however elaborate, is going to give you any better a container than that which results from the mutual confidence and understanding of user and supplier alike.

Vital: Visits to supplier plants

Just how package specifiers and buyers are to get a thorough knowledge of their suppliers' manufacturing art is a hard problem. Some users say that ideally such a person should have worked in the container manufacturing field involved. Perhaps a more practical arrangement is to provide for systematic plant visits of sufficient duration to expose the user-visitor to at least the important subtleties of the manufacturing process.

Far-sighted management clearly recognizes the distinct value of these visits — however much time they appear to take away from the day's work. A man may urgently need the time required for a supplier plant visit. But whether he realizes it or not he may have greater need for that vital visit.

Bruce Holmgren

Editor

Circle No. 241 on Reader Service Card →

VISQUEEN film cuts bag costs 50%, boosts production 67% for marble manufacturer

Trade Mark

"We saved $10,000 a year, got seven million more packages in the bargain, when we switched to automatic packaging with VISQUEEN film."

This is the report of Roger Howdyshell, general manager of Marble King, Inc., St. Mary's, West Virginia. He gets a radical production increase with the same labor force for a substantial saving in overall costs. Mr. Howdyshell also finds that the new package of VISQUEEN film increases shelf life and improves product eye appeal.

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